Why do people buy organic? An analysis of the attitudes and intentions toward organic food purchase

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Master Thesis

Why do people buy organic?
An analysis of the attitudes and intentions toward organic food purchase

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Abstract

This dissertation seeks to analyze the relation between attitudes, purchase intentions and organic food purchase. On the basis of results from a survey conducted with a German sample, it is found that women buy more organic food than men. By analyzing participants' attitudes, the study reveals that women value satisfaction they get from organic food the most and sensory appeal the least. Indifference toward organic food is rated high and price seems to not to be a barrier. A factor analysis and a subsequent correlation analysis reveal that attitudes, purchase intentions and purchase behavior are intercorrelated. Economic implications and future research are discussed.

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1 Introduction

Regarding the production and certification of organic food, the European Union (EU) sets "very strict limits on chemical synthetic pesticide and synthetic fertilizer use, livestock antibiotics, food additives [such as flavor enhancers, artificial aromas and colorants], and processing aids and other inputs" (European Commission, 2014, para. 3). Since 2010, every pre-packaged organic product must carry the organic logo of the EU. This logo for organic certification in the EU can be accompanied by other private or national logos (Willer & Lernoud, 2014). In 2001, the German national organic label has been introduced, besides the already existing private organic labels in Germany. The introduction of the national organic label contributes to the trust of consumers in organic food products and a better reputation leading to a reduction in misleading labeling and unfair competition. And still, the organic regulations and their transparency are continuously improved (Federation of the Organic Food Industry, n.d., para. 6).

The eco-regulation of the EU not only specifies that organic food has to be processed in a way that synthetic pesticides and synthetic fertilizers are not used, but it also regulates that organic farming includes wide crop rotation and enhancement of soil fertility, responsible use of energy and natural resources, maintenance of biodiversity, increase of livestock in free-range and the improvement of specific behavioral needs of animals (European Commission, 2014, para. 3–6).

In order to give organic certification, the eco-regulation of the EU specifies that organic products must contain at least 95 % organic ingredients and can contain at most 0.9 % of genetically modified ingredients (European Commission, 2010). Similarly to the organic logo of the EU, organic food certified with the German national organic label must contain at least 95 % organic ingredients, whereas the remaining 5 % can be only of conventional ingredients if certain ingredients cannot be found organically produced. Organic products certified with the national German organic label must not contain any genetically modified ingredients at all (Federal Ministry for Alimentation, Agriculture and Consumer Protection of Germany, 2010). This shows that the restrictions of the German organic certification are stricter than the restrictions of the EU. The stricter regulations do not only refer to the labeling of organic food as such but also to organic farming processes in Germany which communicate greater security in the production and the quality of organic food products (Federation of the Organic Food

Industry, n.d., para. 6). German purchasers of organic food are found to consider ethical attributes such as animal welfare, regional production, faire prices and biodiversity significantly more than individuals from other European countries (Zander & Hamm, 2010).

Worldwide market size for organic food has grown from 15.2 billion dollars in 1999 to 63.8 billion dollars in 2012 which is more than the quadruple (Willer & Lernoud, 2014). The worldwide organic cultural land has more than tripled from 11 million hectares in 1999 to 37.5 million hectares in 2012. In Europe, 11.2 billion hectares of agricultural land is managed organically by more than 320.000 farms whereby this represents 2.3 per cent of the overall agricultural land that is used in Europe (Willer & Lernoud, 2014). Spain, Italy, Germany and France have the largest agricultural terrains in Europe. The highest number of European organic farms is in Italy, followed by Austria, Spain, and Germany (Ecobank, 2000). Willer & Lernoud (2014) emphasize that updated data on the total organic area are available but not necessarily data on the number of farms or land use as countries do not report these figures. Switzerland, Denmark and Luxembourg have the highest per capita consumption of organic food, and in Denmark, Austria and Switzerland, organic food has the highest market share. The leading organic market in Europe is the German market with an estimated value of 8 billion euros, followed by France (4 billion euros) and the UK (1.95 billion euros) (Willer & Lernoud, 2014).

Due to its continuous expansion, organic food gained importance in the last decades and became a field of interest for many researchers. Thereby not only motivations and intentions to purchase, but also values, beliefs, norms and attitudes toward organic food and purchase frequency have been investigated in order to find out more about the consumers' decision making process and to choose implications for marketing activities. Barrena & Sánchez (2010) state that quality has become the key marketing strategy; demonstrating individuals' increasing concern for their own health and the environment. The role of marketing is to provide individuals with more information regarding organic food as they want "to be aware about how organic production and processing is indeed different from the conventional one and how organic products can be distinguished" (Zanoli & Naspetti, 2002, p. 652). Barrena & Sanchéz (2010) point out that a deeper understanding of the motivations of organic food purchase can help to develop marketing strategies which are adapted to purchasers' needs and this can increase overall organic consumption. From a sustainable point of

view, marketing activities should be a "process of creating, communicating, and delivering value to customers in such a way that both natural and human capital are preserved and enhanced throughout" (Martin & Schouten, 2012, p. 10). The sustainable marketing of organic food products can be understood as part of this process.

In Germany, organic food is mostly sold via specialized organic food stores and farms whereas in most other European countries, organics are sold in conventional food shops (Hamm & Gronefeld, 2004). By now, German discount stores also have introduced organic food products to their assortment (Gottschalk & Leistner, 2013) which allows also families with a lower income and individuals with migration background to consume organic products (Richter, 2007). Moreover, organic products are not seen exclusively as premium products anymore as they are comparable with conventional products with regard to price (Richter, 2007). Through the entrance of organic food products in discounters such Aldi or Lidl, the perception of organic food prices might be modified (Padilla Bravo et al., 2013).

Since the introduction of the national organic food label in Germany, between 2000 and 2005, organic food sales increased by 70 % in Germany. On average, between date 1 and date 2, 18 new labels of organic food were registered every day (Richter, 2007). Over the years, organic products are said to establish more in the mass market, lose their image as special products but also their negative image as being expensive and to be no niche products anymore (Richter, 2007). The same researcher prognosticates that regionalism, animal welfare and nature protection will become more important topics in organic farming in Germany.

2 Relevance

Despite the increase in organic food purchases during the last years and Germany's position with the highest annual turnover of organic food products in Europe, the overall market share of organic food in Germany is still small with 3.9 % of the total food market (Schaack, 2013). The consumption of organic food in Germany is not as high as in other European countries when regarding at consumption per capita (Willer & Lernoud, 2014), and the high turnover is mainly due to the relatively large population of Germany. Positive attitudes are still accompanied by a small market share for organic food products. This shows that there is market potential and lot of research left in this field. A better understanding of the motives and barriers would allow further

promotion of organic food purchase (Krömker & Matthies, 2008). By investigating the individual's decision making process for organic food, thus how his attitude, purchase intention and purchase behavior are related, conclusions can be drawn and marketing activities can be adapted accordingly

3 Literature Review

Motivations of organic food purchase

Previous studies find different motives regarding individuals' attitudes toward organic food products and the corresponding purchase behavior. While many studies point out health consciousness, food safety and sensory appeal as the main motives for purchasing organic food, others state that more altruistic reasons such as the protection of the environment and the welfare of animals determine purchasing behavior for organic food products. Still other studies find both self-related and altruistic motivations to influence purchasing behavior.

Health consciousness is related to individuals' perception of organic food as food "without chemicals that is favorable to health" (Zagata, 2014, p. 248). Food safety is defined as the consumers' concerns about the use of pesticides, "chemical […] fertilizers, artificial additives and preservatives" in farming and the residues remaining in the food (Michaelidou & Hassan, 2008, p. 164). Sensory appeal comprises the "taste, smell, appearance and overall quality" of organic food (Chen et al., 2014, p. 348). Becker et al. (2015) describe altruistic motivations of organic food purchase as the process of "building and maintaining of healthy soil and ecosystems" (p. 343). Honkanen, Verplanken & Olsen (2006) give the same definition as Becker et al. (2015) and they add that participants with altruistic motivations additionally think that organic food is produced without hurting animals (p. 424).

Previous studies analyze the motivations of organic food purchase and find different results. For instance, Chinnici et al. (2002) use a sample of Sicilian inhabitants and conduct face-to-face interviews. A total of 552 subjects participate in the study and complete a survey. Their results show that health is mentioned in more than 50 % of the cases when participants are asked to name the motivations for the choice of organic products. Health consciousness is followed by curiosity and environmental concern as well as taste and nutritional content. The results of this study can be seen in Figure 1.

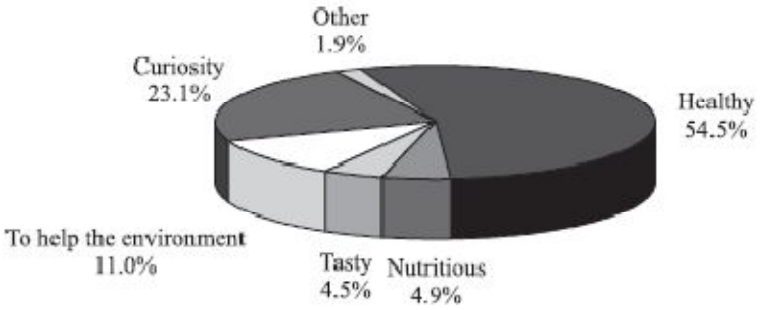

Figure 1 *Reasons for the choice of organic products.* Reprinted from "A multivariate analysis on the consumers of organic products," by Chinnici et al., 2002, *British Food Journal*, 104(3–5), 187. Copyright by MCB UP Limited.

Magnusson et al. (2003) use a random nation-wide sample of 1154 Swedish citizens. In their survey, the researchers concentrate on the buying rather than on the consumption and ask subjects about their purchase frequency, their attitudes toward organic food and their intention to buy, the importance of organically produced food, and the perceived availability of specific organic food products. In a second part, participants are asked about the perceived consequences of buying organic food in general. A multiple regression analysis reveals that, again, concern for one's own or family health is the most important predictor of attitudes and purchase intention. Using open and closed-ended questions in a sample of 200 participants from the UK, McEachern & McClean (2002) aim at identifying consumers' perceptions, attitudes, knowledge, and buying behavior. They find a majority of egocentric motivations such as improved taste, food safety and health benefits as the top three. Zagata (2014) collects data from 32 regular organic buyers and creates a hierarchical value map showing the most important attributes, consequences and values of the respondents. The results reveal that Czech participants mainly see organics as food favorable to health. Paul & Rana (2012) conduct face-to-face interviews with an US sample including 301 participants aware about organic food and a questionnaire with closed-ended questions is added to the interviews. The participants are asked about the main reasons for purchasing organic food and the majority states that overall benefit, i.e. healthy content, environment friendly packaging and environment friendly technology are the benefits that they seek from organic food (Figure 2). An additional regression analysis reveals that health is the best predictor of organic food purchase, followed by availability and education, but also environmental protection, taste, quality and status in the society are found to be very important motivations of organic food purchase.

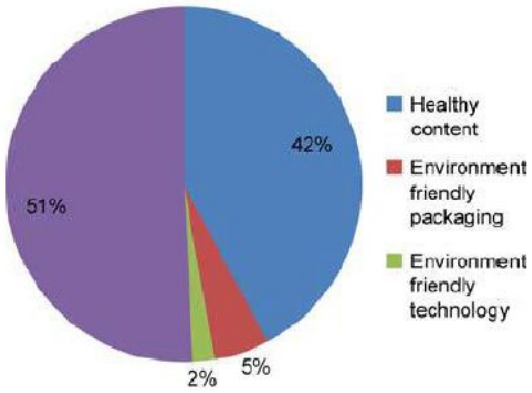

Figure 2 *Reasons for buying organic food.* Reprinted from "Consumer behavior and purchase intention for organic food," by Paul & Rana, 2012, *Journal of Consumer Marketing*, 29(6), 416. Copyright by Emerald Group Publishing Limited.

Padel & Foster (2005) interview in total 96 participants from the UK in focus groups and summarize that purchasing behavior for organic food is mainly driven by health consciousness but also by social aspects such as the support of local farming. Subjects associate local farming with "feeling good" which shows that the association between organic food and local farming can lead to satisfaction (p. 618). Figure 3 visualizes the cognitive structure of motivations for buying organic fruit and vegetables.

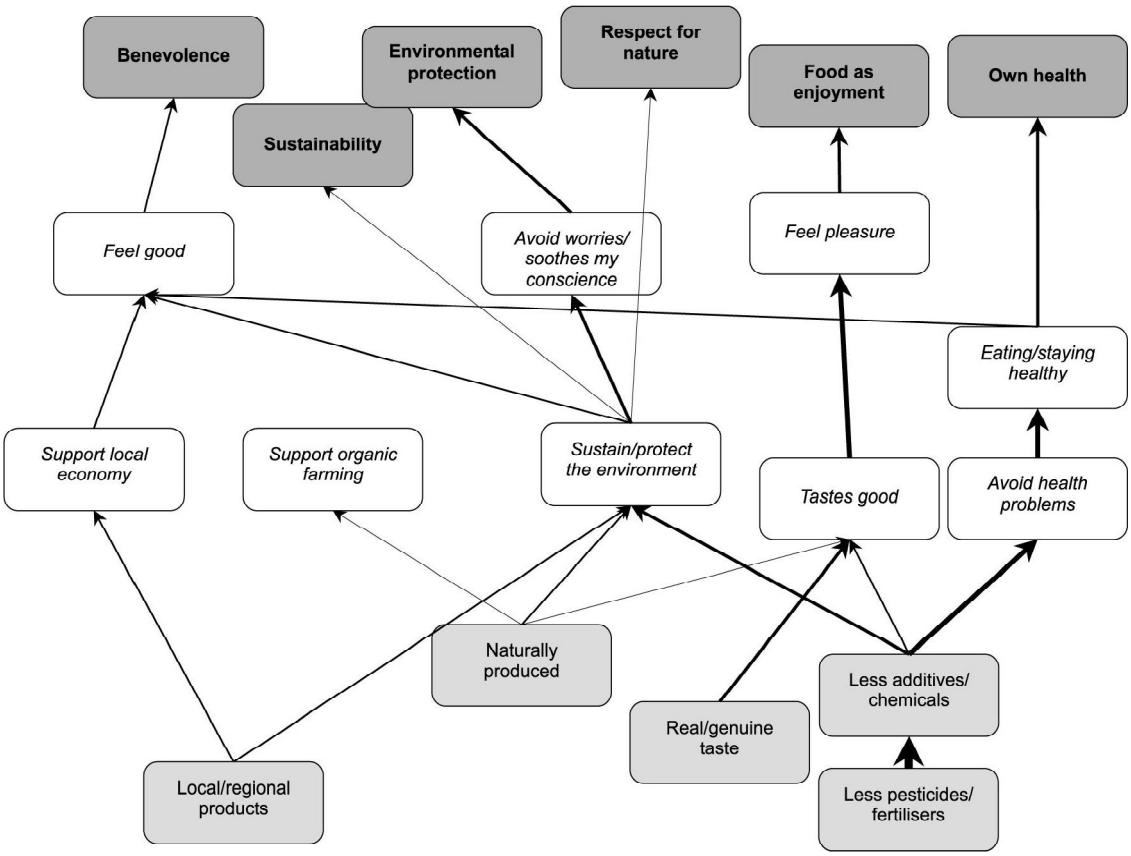

Figure 3 *Cognitive structure of motivations for buying organic fruit and vegetables.* Reprinted from "Exploring the gap between attitudes and behaviour," by Padel & Foster, 2005, *British Food Journal*, 107(8), 612. Copyright by Emerald Group Publishing Limited.

By interviewing 60 regular and occasional Italian consumers of organic food and applying the hard-laddering approach, Zanoli & Naspetti (2002) create maps which show that aspects linked to health and well-being occupy a central position in the cognitive structure of both groups of participants. Besides, the researchers find taste and nutritional content to be also purchase motives participants are attached to. The hierarchical value map can be seen in Figure 4.

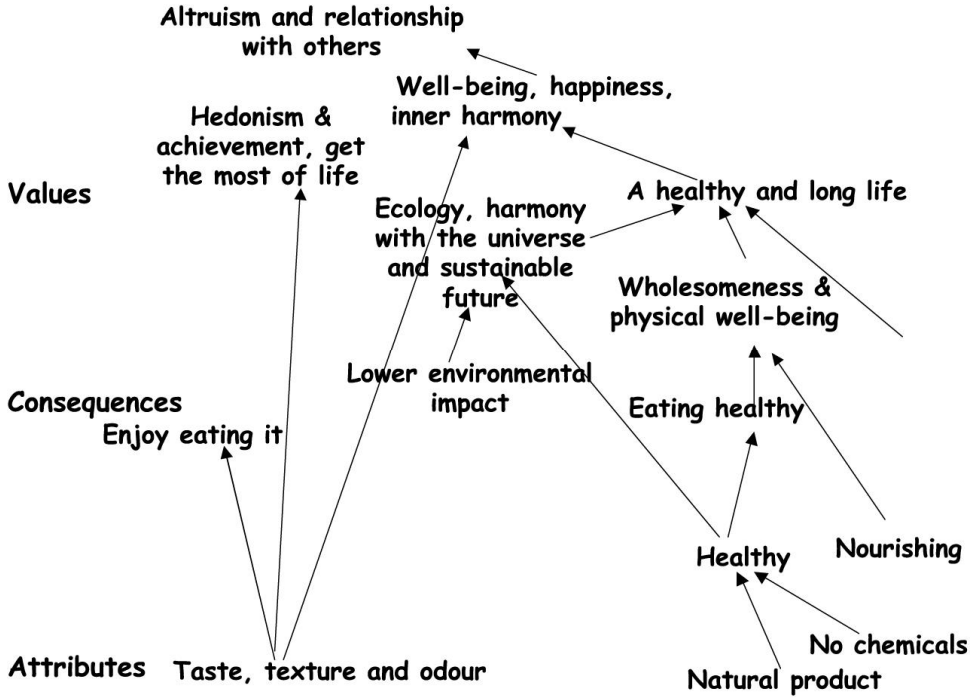

Figure 4 *Hierarchical value map of positive ladders of the regular consumers.* Reprintend from "Consumer motivations in the purchase of organic food," by Zanoli & Naspetti, 2002, *British Food Journal*, 104(8), 643. Copyright by MCB UP Limited.

Chen et al. (2014) distribute questionnaires to a total sample of 935 Chinese participants in supermarkets in four major Chinese cities. After running a factor analysis, the researchers find a high loading for the dimension "certification" representing the labeling of organic food as such. The researchers explain that recent food scandals in China have led to considerable confusion among Chinese and reduced the trust in overall organic food quality. Therefore, Chinese are concerned about food safety and doubt the certification of organic food and its quality.

Michaelidou & Hassan (2008) use the answers from 222 self-completion questionnaires of a Scottish convenience sample. It is then analyzed whether relationships between attitude, food safety concern, health consciousness, ethical self-identity and intention to buy exist. A regression analysis reveals that the variables health consciousness, food safety concern and ethical self-identity affect attitude toward

organic food, yet the impact of health consciousness is smaller. The researchers also find that attitude toward organic food and the variables food safety concern, health consciousness and ethical self-identity significantly impact the intention to buy; yet, after controlling for the effects of attitude, their impact is not significantly different from zero. This shows that attitude functions as a mediator between the variables health consciousness, food safety concern and ethical self-identity and intention. O'Donovan & McCarthy (2002) use a questionnaire and collect data on the purchase behavior for organic meat of 250 Irish subjects representing the Irish population. They report food safety combined with health issues to be the main motivations. Figure 5 demonstrates participants' concerns regarding food safety.

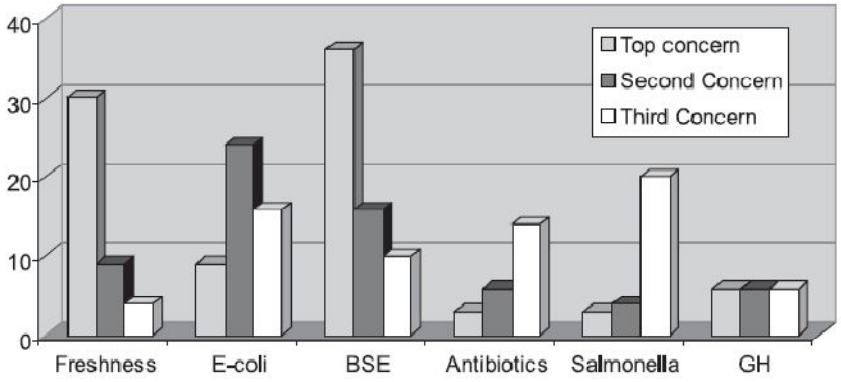

Figure 5 *Food safety concerns among consumers – percent of respondents.* Reprinted from "Irish consumer preference for organic meat," by O'Donovan & McCarthy, 2002, *British Food Journal*, 104(3–5), 353. Copyright by MCP UP Limited.

On the basis of a sample of 1.154 participants from the Swedish national population register, Magnusson, Arvola, Koivisto Hursti, Aberg, & Sjödén (2001) collect answers regarding four different organically produced food products and ask questions about the attitudes and the intention to buy organic food, the importance of purchase criteria, purchase frequency, perceived availability of organic food and the importance of the price. They find that taste is considered as the most important criterion to buy organic food, followed by a long shelf-life and health consciousness. The attribute "organically produced" is seen as the least important motivation so that it can be interpreted that organic food as a status symbol does not play a role here. The results of Chen et al. (2014) confirm the previous finding by also citing sensory appeal such as the taste, but also the smell and the appearance of organic food to be important for the purchase decision. When purchasing food, Chinese expect visual signs of quality. This shows that the sensory appeal of organic food may be related to the evaluation of its quality.

In the study conducted by Becker et al. (2015), 250 Israeli organic and non-organic participants have to rank motives such as price, taste, health and environmental awareness on a 5-point-scale of importance. The researchers then analyze which motives influence the decision to belong to the organic or non-organic group. Their study reveals that environmental awareness is a significant variable in deciding to become an organic consumer and that price and taste are the factors which determine how much organic food is purchased. Padilla Bravo et al. (2013) base their study on data gathered from a big sample of 13.074 responses from the German National Nutrition Survey II whereby the data consist of the subjects' buying frequency for 12 food groups. A factor analysis on purchasing motives clusters motives in the four dimensions healthiness, altruism, convenience and exclusiveness. The dimension altruism describes the concern about environment and animal welfare, consumers' political attitudes and social aspects which influence the demand for organic food. Convenience is defined as the availability and location of organic food related to the search cost as well as the placement within the store and packaging characteristics. Exclusiveness takes into consideration that consumers' perception of organic food is to some extent comparable with the perception of regional and specialty food. This dimension is defined through a positive attitude toward this type of food and a higher willingness-to-pay. It is found that the dimension altruism constructed through the items animal welfare, eco-packaging, fair trade, GMO-free[1], and seasonality is the most important motive affecting organic purchase behavior.

By distributing open-ended and closed-ended questionnaires to a sample of 40 French and Italian participants, Guido et al. (2010) aim at measuring subjects' frequency and likelihood to purchase organic food products immediately after the experiment, the attributes that stand for the organic food image and subjects' moral norms. In addition, the researchers identify subjects' attitudes toward organic consumption and subjects' perception of the image of organic food products. By controlling for the likelihood of buying as the dependent variable of purchasing behavior, they find that subjects' purchase behavior is mainly based on ethical norms regarding the protection of human health and the environment, both from a moral and a material perspective. Table 1 summarizes the findings of previous studies regarding motives of organic food purchase.

[1] GMO = genetically modified organisms

Study	Sample size	Country	Sampling method	Main motivation
Chinnici et al. (2002)	552	Sicily	Face-to-face interviews, questionnaires	Health consciousness
Magnusson et al. (2003)	1154	Sweden	Questionnaires	Health consciousness
McEachern & McClean (2002)	200	UK	Open- and closed-ended questions	Taste, food safety, health consciousness
Padel & Foster (2005)	96	UK	Focus group interviews	Health consciousness, local farming
Zagata (2014)	32	Czech Republic	Means-end chain approach	Health consciousness
Paul & Rana (2012)	301	USA	Face-to-face interviews, closed ended questions	Health consciousness
Zanoli & Naspetti (2002)	60	Italy	Means-end chain approach	Health consciousness, well-being
Chen et al. (2014)	935	China	Questionnaires	Food safety, sensory appeal
O'Donovan & McCarthy (2002)	250	Ireland	Questionnaires	Food safety
Michaelidou & Hassan (2008)	222	Scotland	Questionnaires	Food safety
Magnusson et al. (2001)	1.154	Sweden	Questionnaires	Taste
Becker et al. (2015)	250	Israel	Closed-ended questions	Environmental awareness
Padilla Bravo et al. (2013)	13.074	Germany	Computer assisted personal interviews, questionnaires	Animal welfare, eco-packaging, fair trade, GMO-free, seasonality
Guido et al. (2010)	40	France, Italy	Open- and closed-ended questions	Protection of human health and environment

Table 1 Summary of previous findings regarding motivations of organic food purchase

Barriers of organic food purchase

Becker et al. (2015) find price to significantly but negatively influence purchase. Lee & Yun (2015) collect data from 725 surveys conducted in the US and measure the attributes nutritional content, natural content, ecological welfare, sensory appeal and price, but also attitudes and purchase intentions on a 7-point Likert scale. The researchers find that price perception is negatively related to attitude toward organic food as well as to actual purchase. Besides Becker et al. (2015) and Lee & Yun (2015), Magnusson et al. (2001) find that about half of their participants state that price is a barrier for buying organic food and in order to purchase organic food, more than half of

the participants say that organic food has not to be more expensive than conventional food. Even if individuals have favorable attitudes toward organic food, the higher price of is a key deterrent (O'Donovan & McCarthy, 2002). By collecting data from 529 Flemish participants, Aertsens, Mondelaers, Verbeke, Buysse & Van Huylenbroeck (2011) identify high prices but also the lack of availability of organic food as key barriers. An overview of the mean ratings is presented in Figure 5.

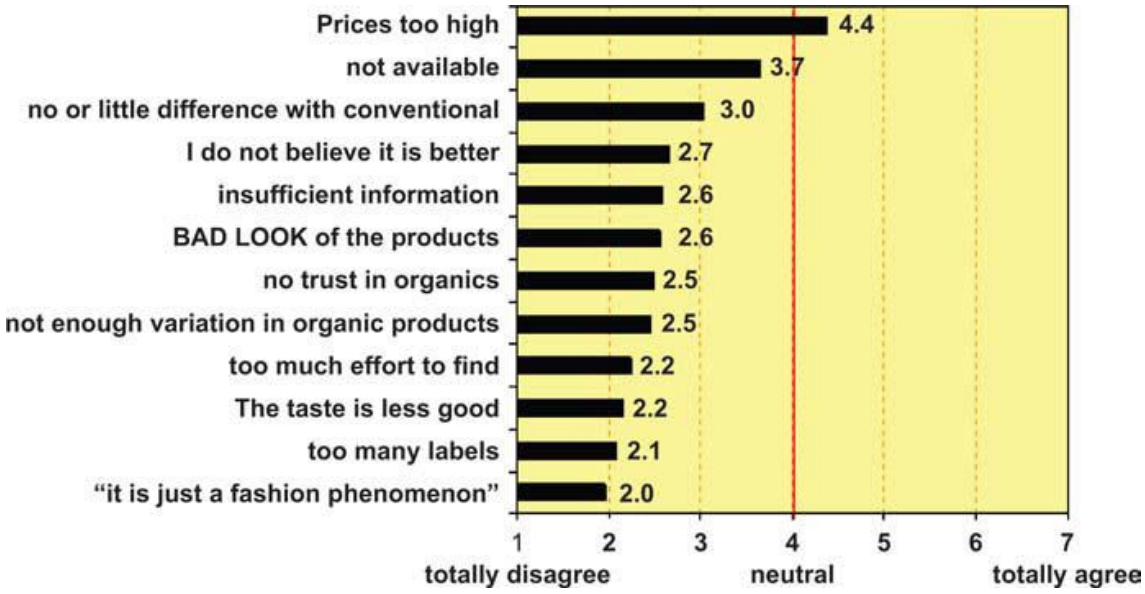

Figure 6 *Barriers for buying organic vegetables (ordered by decreasing importance*). Reprinted from "The influence of subjective and objective knowledge on attitude, motivations and consumption of organic food," by Aertsens et al., 2011, *British Food Journal*, 113(11), 1364. Copyright by Emerald Group Publishing Limited.

Paul & Rana (2012) find that non-availability of organic food is cited as the major barrier in the purchase of organic food followed by high price. The results are presented in Figure 7.

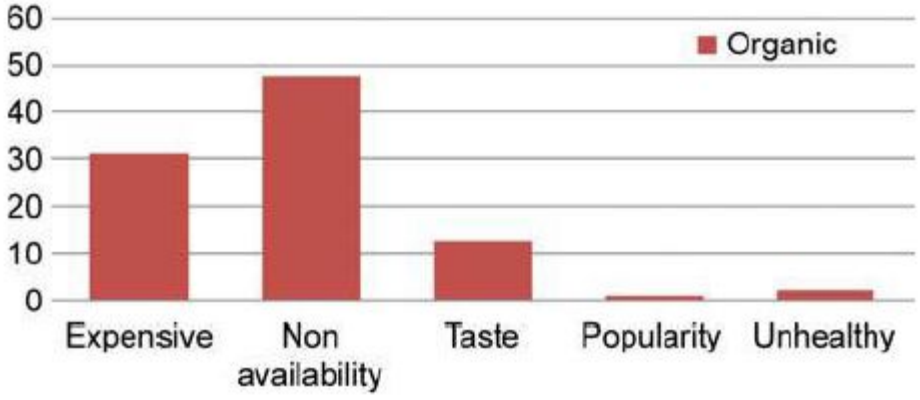

Figure 7 *Reasons for non-purchase of organic food.* Reprinted from "Consumer behavior and purchase intention for organic food," by Paul & Rana, 2012, *Journal of Consumer Marketing*, 29(6), 416. Copyright by Emerald Group Publishing Limited.

Based on the data of a Costa Rican sample of 480 participants, Aguirre (2007) reports that non-availability and a high price, but also appearance of organic food are the main reasons for not purchasing. The researcher points out the importance of "cosmetic defects". On the basis of personal interviews with 1.612 participants in eight Greek cities, Fotopoulos & Krystallis (2002) find price to be the second major barrier after non-availability. Davies, Titterington & Cochrane (1995) analyze the results of three studies run in Northern Ireland between 1989 and 1993, comprising a total sample of 2.185 participants and identify price and the lack of availability to inhibit purchase. Similarly, Zanoli & Naspetti (2002) find that most of their subjects perceive organic food products as expensive and difficult to find, yet they judge them positively (Figure 8). Table 2 summarizes the findings of previous studies.

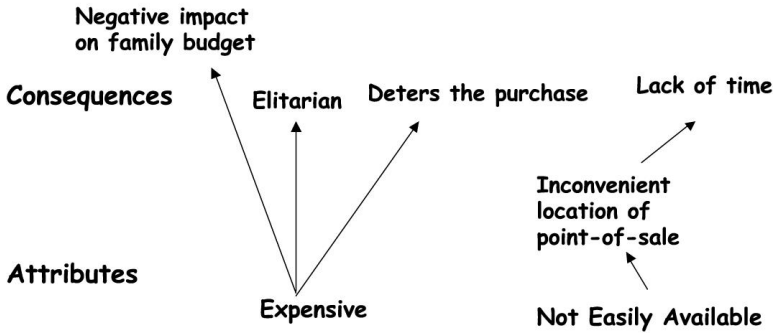

Figure 8 *Hierarchical value map of negative ladders of the regular consumers.* Reprintend from "Consumer motivations in the purchase of organic food," by Zanoli & Naspetti, 2002, *British Food Journal*, 104(8), 643. Copyright by MCB UP Limited.

Study	Sample size	Country	Sampling method	Main barrier
Becker et al. (2015)	250	Israel	Closed-ended questions	Price
Lee & Yun (2015)	725	USA	Questionnaires	Price
Magnusson et al. (2001)	1.1.54	Sweden	Questionnaire	Price
O'Donova & McCarthy (2002)	250	Ireland	Questionnaires	Price, lack availability
Aertsens et al. (2011)	529	Flanders	Questionnaires	Price, lack of availability
Paul & Rana (2012)	301	USA	Face-to-face interviews, closed ended questions	Lack of availability
Aguirre (2007)	480	Costa Rica	Questionnaires	Lack of availability, price, appearance
Fotopoulos & Krystallis (2002)	1.612	Greece	Personal interviews	Lack of availability, price
Davies et al. (1995)	2.185	Northern Ireland	Surveys, interviews	Price, lack of availability
Zanoli & Naspetti (2002)	60	Italy	Means-end chain approach	Price, lack of availability

Table 2 Summary of previous findings regarding barriers of organic food purchase

Socio-demographic factors

In the context of organic food, not only motivations and barriers play a role but also individuals' socio-demographic profile can be related to their purchase behavior for organic food. Researchers agree on the profile of the typical organic purchaser which is mainly female, younger aged, with one or two children, better educated and with an above-average income (Aguirre, 2007; Becker et al., 2015; Davies et al., 1995; O'Donovan & McCharthy, 2002).

Although researchers agree that more women than men buy organic food products, men are found to be willing to pay more for organic food than women (Ureña, Bernabéu & Olmeda, 2008) and have better environmental knowledge than women (Kollmuss & Agyeman, 2002). Ureña et al. (2008) conduct face-to-face interviews with regular food shoppers in Spain and a sample of 464 participants is randomly selected. By calculating the odds-ratios of the differences in consumer willingness to pay for organic food between men and women, the researchers find that men's willingness-to-pay for several organic products tested is significantly higher than that of women. Women as primary buyers in a family are usually responsible for the family's food shopping which may explain the higher number of women purchasing organic food. In his study, Aguirre (2007) finds that 61 % of the participants state that the main buyer in their family is female.

The findings regarding age are not consistent. Whereas some studies reveal that older individuals are more likely to purchase organic food, other researchers state that organic food purchasers are middle-aged and a larger part of studies find organic food purchasers to be of younger age. On the basis of a Nielsen homescan dataset for 41.000 US households, Dettmann & Dimitri (2010) find that 49 % of the households which purchase organic food products are older than 50 years and Aguirre (2007) finds that average age of organic purchasers is 46. Magnusson et al. (2001) discover that young respondents between 18 and 25 years have a more positive attitude toward organic food products such as potatoes and bread than respondents between 26 and 65 years. By running a regression analysis, the results of Onyango et al. (2007) reveal that female and young consumers who are aged between 18 and 32 years are more likely to purchase organic food products than male and middle-aged respondents who are between 33 and 51 years old.

Older people tend to purchase organic food due to health reasons and younger people are more environmentally conscious, but have, at the same time, limited purchasing power (Fotopoulos & Krystallis, 2002). Several researchers describe the curve representing the relation of age and organic food consumption as U-shaped (Curl, Beresford, Hajat, Kaufman, Moore, Nettleton & Diez-Roux, 2013; Kriwy & Mecking, 2012). This U-shaped relation is presented in Figure 9.

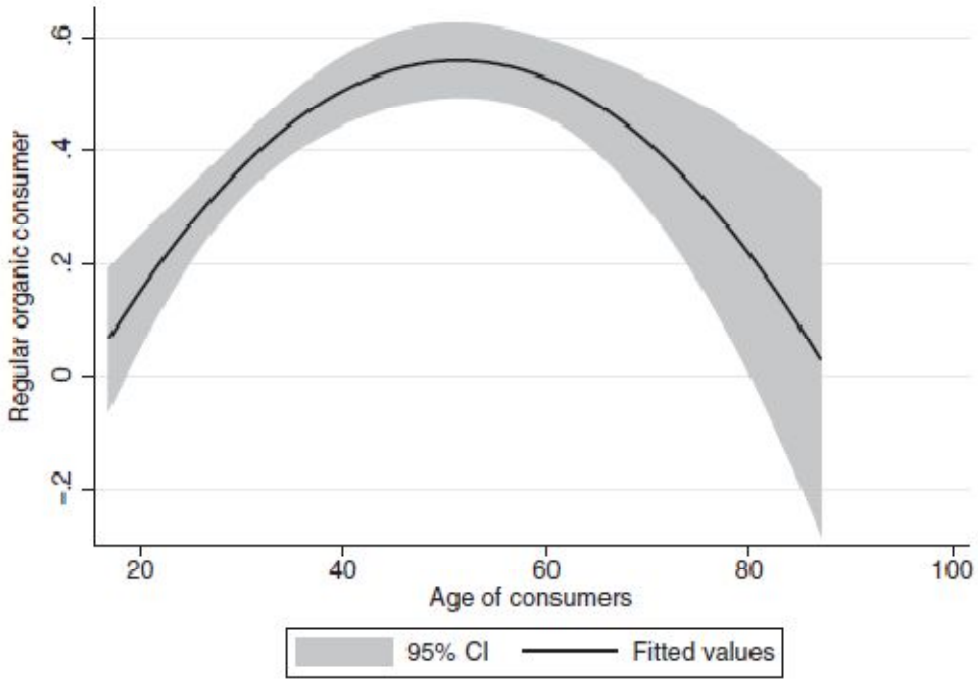

Figure 9 *Inverted u-shaped relation between age and the purchase of organic products*. Reprinted from "Health and environmental consciousness, costs of behaviour and the purchase of organic food," Kriwy & Mecking, 2012, *International Journal of Consumer Studies*, 36(1), 35. Copyright by Blackwell Publishing Ltd.

Besides gender and age, children living in the household are found to positively influence purchase behavior for organic food, whereby a family of three to four family members with two or less children has the greatest impact. In their third study, Davies et al. (1995) find that 44 % of purchasers who have a higher willingness-to-pay for organic food are in households with children, compared with 41 % who are living without children. Becker et al. (2015) report that Israeli consumers of organic food have more children than non-consumers. Yet, on the basis of a multiple regression, the variable children has a negative sign indicating that once participants start to buy organic food, the number of children has a negative impact on the quantity purchased.

It is found that an upper-middle level of income and education are positively affecting organic purchase behavior. Aguirre (2007) finds an average income of 957.56$ for a Costa Rican sample of organic consumers. By creating four clusters of

users of organic food, Fotopoulos & Krystallis (2002) reveal that the participants who are in the cluster with the highest income, are also less price sensitive toward organic food, e.g. whereas in cluster 4, 11.3% earn more than 14.000$ monthly and 24.6 % state price to be a barrier from buying organic food, in cluster 1, 1.8 % of the participants earn more than 14.000$ monthly and 43.7 % state price to be a barrier. Onyango et al. (2007) report that participants with a college education or more are more likely to purchase organic food than those with only some college education.

On the basis of 660 Greek participants, Tsakiridou, Boutsouki, Zotos & Mattas (2008) find that demographics such as education, income, age, employment and household size seem to affect attitudes toward organic food. However, there is no impact of demographics on behavior. The researchers only find significant variations between the organic buyer and non-organic buyer group with respect to age and income. Yet, the differences in the mean values are minor.

Intention as a mediator

To describe individuals' decision making process, Ajzen (1991) developed the theory of planned behavior. This theory consists of the idea that attitude, subjective norm and perceived behavioral control influence behavior through intention (Figure 10).

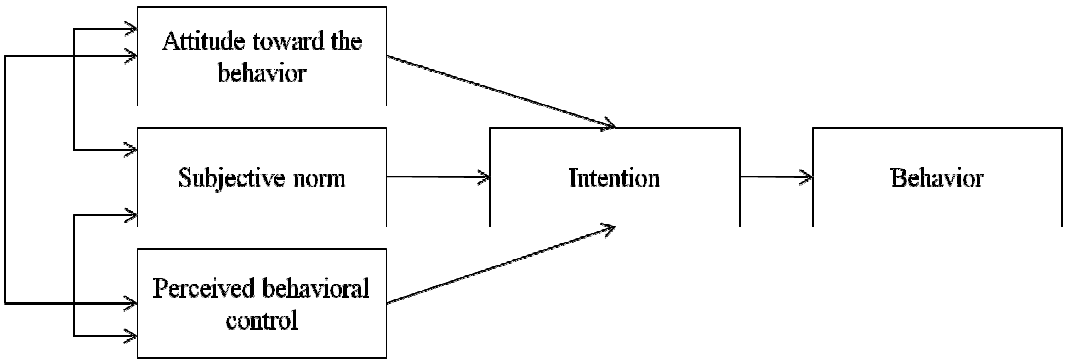

Figure 10 *Theory of planned behavior.* Reprinted from "The theory of planned behavior," by Ajzen, 1991, *Organizational Behavior and Human Decision Processes*, 50(2), 182. Copyright by Academic Press. Inc.

Whereas several researchers apply the theory of planned behavior to the decision making process of organic food purchase (Aertsens et al., 2009; Chen, 2007; Magnusson et al., 2001; Tarkiainen & Sundqvist, 2005), others concentrate on the means-end chain method (Barrena & Sánchez, 2010; Zagata, 2014; Zanoli & Naspetti, 2002) to investigate individuals' cognitive decision making process. The means-end chain framework focuses on the associations between the attributes of a product, the

functional and psychological consequences of the attributes for the individual, and the personal values that the consequences reinforce (Zagata, 2014). Still other researchers simply differentiate between attitude and the intention to buy and how these are stimulated by the motives for organic food purchasing. For instance, Çabuk, Tanrikulu & Gelibolu (2014) report that attitude functions as a mediator between health consciousness, environmental concern and food safety, and intention to buy. On the basis of 385 self-administered questionnaires distributed in Turkey, Çabuk et al. (2014) draw the conclusion that a positive attitude toward organic food is likely to increase the probability of purchasing organic food. In the study of Magnusson et al. (2001), between 46 % and 67 % of the respondents agree that it is quite or very good and important to buy organically produced food, but only 10 % of the respondents state that it is very likely that they will choose organic food products the next time they buy food.

Attitude-action gap

Ajzen & Fishbein (1980) point out that a high correlation between attitude and behavior only exists if the attitude toward that particular behavior is considered. For instance, attitude toward climate change and driving behavior do not often show a correlation, meaning that even people who are very concerned about climate change tend to drive. Kollmuss & Agyeman (2002) explain that "attitudes do not determine behavior directly; they rather influence behavioral intentions which in turn shape our actions" (p. 242). The researchers argue that people are rational, e.g. they make use of information and are not controlled by unconscious motives: Yet, intentions are not only influenced by attitudes but also to social norms. Figure 11 visualizes the "Theory of reasoned action" proposed by Ajzen & Fishbein (1980).

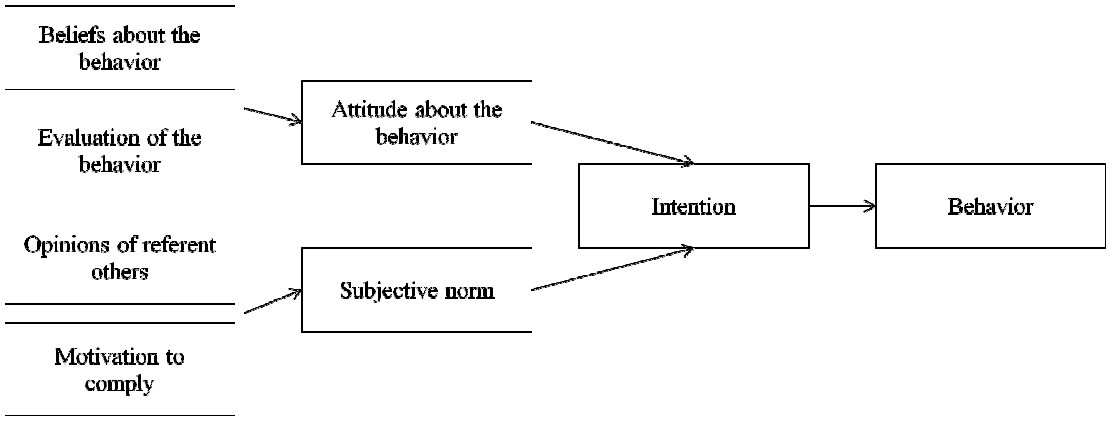

Figure 11 *Theory of reasoned action*. Reprinted from *Understanding attitudes and predicting social behaviour* by Ajzen & Fishbein, 1980, Englewood Cliffs, NJ: Prentice-Hall.

Blake (1999) explains that three barriers limit action. Besides individual constraints such as attitudes and intentions which may not be pronounced enough to actually change behavior, there are also barriers of perceived responsibility and practicality. Responsibility stands for the notion of "locus of control". Individuals who do not act pro-environmentally often feel that they do not have an influence on the situation. This reflects a "social dilemma where people do not see that acting on their own would make any difference" (Blake, 1999, p. 266). Practicality describes the social and institutional, thus external, constraints that prevent people from acting pro-environmentally. Blake (1999) emphasizes that practicality barriers may be for instance lack of money or lack of information. Newton and Meyer (2013) collect data on household resource consumption of 1.250 residents in Australia and state that individuals are usually not behaving in a manner that is congruent with their stated attitudes and intentions. Similarly to Blake (1999), it is said that barriers such as indifference, perception of no internal control, lack of information, convenience, lack of time and financial resources can explain the identified gap (Newton & Meyer, 2013).

Figure 12 visualizes at which points gaps between attitudes/behavioral intentions and actual behavior can occur.

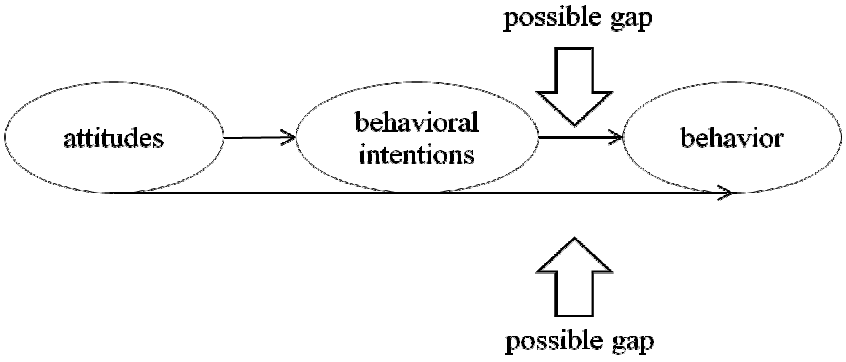

Figure 12 modified from Newton & Meyer (2013): Possible gaps between attitudes/behavioral intentions and behavior

5 Methodology

Hypotheses

Following hypotheses are tested via the questionnaire:

H1: Attitudes toward organic food are positively correlated with purchase intentions of organic food.

H2: Attitudes toward organic food are positively correlated with purchase behavior for organic food.

H3: Purchase intentions of organic food are positively correlated with purchase behavior for organic food.

H4: Socio-demographic factors such as being female instead of being male, a higher level of education and of income, and an increasing number of children in the household are positively correlated with the purchase behavior for organic food. Increasing age is negatively correlated with purchase behavior for organic food.

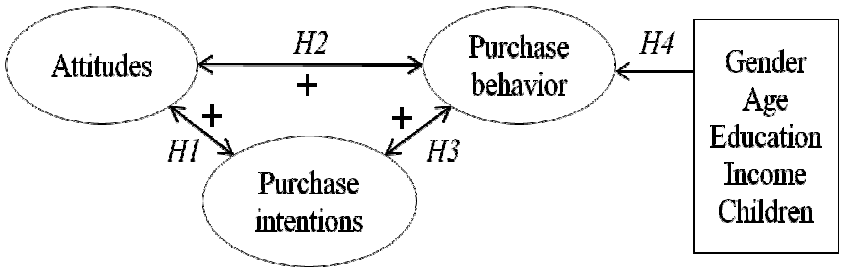

Figure 13 Hypotheses 1-4

H5: *Purchase intentions of organic food mediate the relationship between attitudes toward organic food and purchase behavior of organic food.*

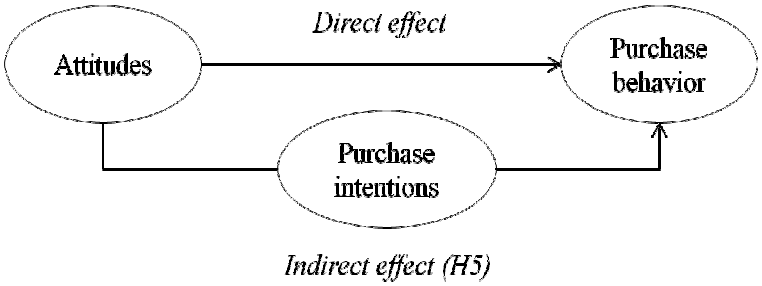

Figure 14 Hypothesis 5

Participants

Participants were informed and mainly recruited through social networks such as *Facebook* and in forums about organic food such as *Naturkost* and *Bio-Oeko-Forum*. Due to the German language of the survey, it was ascertained that only German-speaking participants will answer the survey. The study is limited to the region of Germany due to the specificity of the cultural background which might influence organic purchase behavior.

In total, 151 individuals answered the questionnaire, whereby the answers of 37 participants could not be counted due to insufficient completion. 3 participants did not pass the first filter question and were excluded from the survey as they have never heard of the term "organic food products". 5 other participants did not classify any of the presented statements right and were not considered in the analysis of the data. Due to this elimination, there remained 106 complete questionnaires for the analysis.

Table 3 shows the descriptive statistics of the socio-demographic variables. In total, there are 106 participants with 82 being female and 24 being male. Respondents are on average 26 years old ($M = 26$, $SD = 6.26$) with the youngest participant being 16 and the oldest participant being 57 years old. None of the participants states to have no school degree at all and 79.24 % of the participants have less than 2.000€ per month at their disposal. A large majority of 92.45 % of the participants has no children at all living in their household ($M = 0$, $SD = 0.45$).

	Absolute	**By gender**		**Relative**	**By gender**	
Gender		Female	Male		Female	Male
Female	82			77 %		
Male	24			23%		
Age						
< 20 years	4	4	0	5 %	5 %	0 %
20-30 years	87	75	18	87 %	91 %	75 %
31-40 years	5	0	5	4%	0 %	16 %
> 40 years	4	3	1	4%	4 %	4 %
Education						
Secondary school degree I	1	0	1	1 %	0 %	4 %
Secondary school degree II	7	6	1	6 %	7 %	4 %
Baccalaureate	33	28	5	31 %	34 %	21 %
Bachelor's degree	44	33	11	42 %	41 %	46 %
Master's degree	21	15	6	20 %	18 %	25 %
Income						
< 1.000€	60	52	8	57 %	63 %	33 %
1.000-2.000€	24	17	7	22 %	21 %	29 %
2.001-3.000€	9	3	6	8 %	4 %	26 %
3.001-4.000€	4	3	1	4 %	4 %	4 %
4.001-5.000€	4	2	2	4 %	2 %	8 %
> 5.000€	5	5	0	5 %	6 %	0 %
Children						
0	98	74	100	92 %	90 %	100 %
1	3	3	0	3 %	4 %	0 %
2	5	5	0	5 %	6 %	0 %

Table 3 Descriptive statistics of the participants

Given that $p = 0.08$, and using $\alpha = 0.05$, the variable *education* is normally distributed. The variables *age*, *monthly income* and *children* yield p-values lower than 0.05, are therefore not normally distributed and cannot be further investigated. The results of a Shapiro-Wilk test of normality can be seen in Table 4.

Variable	Obs	W	V	z	Prob>z
age	106	0.68893	26.966	7.332	0.00000
education	106	0.97808	1.900	1.429	0.07654
income	106	0.85846	12.270	5.579	0.00000
children	106	0.76375	20.480	6.720	0.00000

Table 4 Shapiro-Wilk test of normality for *age, education, income* and *children*

Assessment

The survey starts with a filter question which is retrieved from Fotopoulos & Krystallis (2002) and was reused by Chen et al. (2014). Whereas Fotopoulos & Krystallis (2002) use the filter question to distinguish between "aware users", "unaware users" and "aware non-users", here the filter question is used to ascertain that solely the answers of participants are considered who are familiar with the concept of organic food (Chen et al., 2014).

The following part contains several statements concerning the definition of organic food and it has to be answered whether these statements are true or false. The binary variables are retrieved from Aertsens et al. (2011) and are used to filter those participants who classify none of the statements right.

The main part of the survey contains items regarding participants' attitudes and purchase intentions for investigating motivations and barriers. Participants have to rate every statement on a 7-point Likert scale where 1 indicates strong disagreement and 7 indicates strong agreement as proposed by Chen (2007). There are 92 variables measuring positive attitudes, positive intentions, negative attitudes and negative intentions toward organic food. Whereas the items measuring the attitudes toward organic food are all retrieved from questionnaires used in previous studies, the items which measure the intentions are developed for the purpose of this study. The structure of the questionnaire is depicted in Table 5.

A measure for the purchase frequency of organic food is likewise included into the questionnaire in order to explore the self-reported organic purchase behavior of the participants. Padilla Bravo et al. (2013) categorize individuals as regular organic

purchasers with at least 10 organic purchases per year. Similarly to Padilla Bravo et al. (2013), Fotopoulos & Krystallis (2002) consider individuals who purchase organic food once per month as "aware organic users". The question for measuring purchase frequency used in this survey is retrieved from Fotopoulos & Krystallis (2002).

The last part consists in the collection of socio-demographic data such as gender, age, education, monthly income and the number of children living in the household. The structure of this part is based on the questionnaire used by Nasir & Karakaya (2013). The complete questionnaire can be seen in Appendix A.

Motivations	**Number of items**	**Origin of items**	**Barriers**	**Number of items**	**Origin of items**
Health consciousness	10	Chen (2007) (on the basis of Steptoe & Pollard (1995))	*Price*	4	Tsakiridou et al. (2008)
Food safety	10	Lockie et al. (2002); Tsakiridou et al. (2008)	*Availability*	6	Tsakiridou et al. (2008); Nasir & Karakaya (2013)
Sensory appeal	8	Chen et al. (2007).	*Appearance*	4	Tsakiridou et al. (2008); Nasir & Karakaya (2013)
Environmental protection	8	Chen et al. (2007); Kareklas et al. (2014); Tsakiridou et al. (2008)	*Trust*	4	Nasir & Karakaya (2013)
Animal welfare	4	Chen et al. (2007)	*Knowledge*	4	Tsakiridou etal. (2008) (adapted); Nasir & Karakaya (2013)
Natural content	4	Chen et al. (2007)	*Indifference*	6	Fotopoulos & Krystallis (2002); Tsakiridou et al. (2008)
Quality	4	Chen et al. (2007)	*Image*	2	Gottschalk & Leistner (2013)
Curiosity	2	*Created for the purpose of the study*			
Satisfaction	6	Chen et al. (2007), Barrena & Sánchez (2010)			
Lifestyle	6	Chen et al. (2007), Barrena & Sánchez (2010), Nasir & Karakaya (2013)			

Table 5 Structure of the questionnaire

Procedure

The data was gathered through an online survey created with the program *Qualtrics*. Prior to the online publication of the questionnaire, a trial was conducted to estimate the time one would need to answer the complete questionnaire. This test revealed a processing time of 15 minutes. After that, the questionnaire was translated into German and some minor changes had to be done regarding expressions which are different in German compared with English. In addition to that, the orthography was checked by another German native speaker. After the upload, the questionnaire was accessible online during one month; that is April 2015.

The participants accessed the survey on *Qualtrics* via a web link they were given with the announcement of the study[2]. On the first page of the survey, the participants were informed about the topic, the approximate processing time and the anonymous treatment of their answers. After that, they were asked whether they have ever heard of the term "organic food" and had to state whether the three presented statements are true or false. In the main part of the survey, the participants had to state to what extent they agree or disagree with 92 statements regarding organic food. In the last part of the survey, the participants were asked to indicate their purchase behavior and some information on their socio-demographic profile. On the last page of the survey, the participants were thanked for their participation and were given an e-mail address they could contact in case of questions regarding the survey. The statistical software package *Stata* version 12 was utilized to analyze the data.

6 Results

Filter questions

In order to investigate participants' knowledge about the definition of organic food, the results for the variables *statement2* and *statement3* had to be reversed so that all three variables could be decoded in the same way (1 = right answer, 2 = wrong answer). As already mentioned above, 5 out of 111 participants did not classify any of the statements right and were therefore eliminated from the dataset. The answers to the

[2] An English version of the survey can be accessed via https://qtrial2015az1.az1.qualtrics.com/SE/?SID =SV_02lEtp93sCGPL7v.

first and the second statement are significantly correlated, $r = 0.4428$, $p < 0.01$. The intercorrelations between the answers to the statements are depicted in Table 6. There is no significant correlation between the third statement and the other two statements. Yet, the third statement yielded the highest percentage of correct answers so that it is not eliminated from the analysis.

	statement1	*statement2*	*statement3*
statement1	1.000		
statement2	0.4428	1.000	
statement3	0.1144	-0.1690	1.000

Table 6 Correlation matrix between the variables *statement1, statement2 and statement3*

Purchase frequency of organic food

The results reveal that 9.01 % of the participants state to never buy organic food products, 14.41 % of the participants buy organic products less than once per month and a quarter of the sample buys organic food products approximately once per month. The majority of 34.23 % buys organic products approximately once per week and 17.12 % of the participants buy organic food products more than once per week. Figure 15 provides an overview of the distribution of purchase frequency.

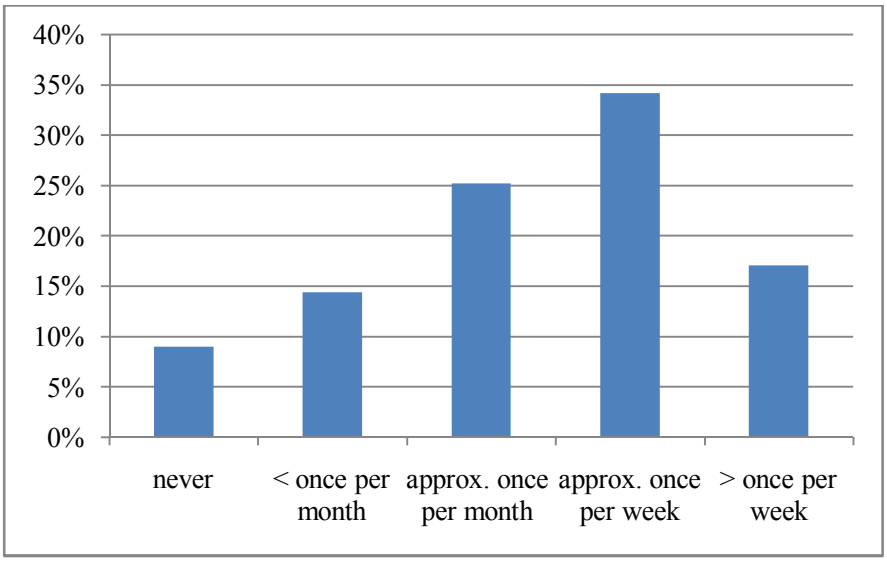

Figure 15 Distribution of purchase frequency of organic food

Figure 16 depicts the distribution of purchase frequency of organic food by gender. A two-sample *t*-test with unequal variances shows that women ($n = 82$, $M = 3.51$, $SD = 1.28$) purchase organic food significantly more often than men ($n = 24$, $M = 2.92$, $SD = 1.15$), $t\,(34.48) = 2.05$, $p < 0.05$.

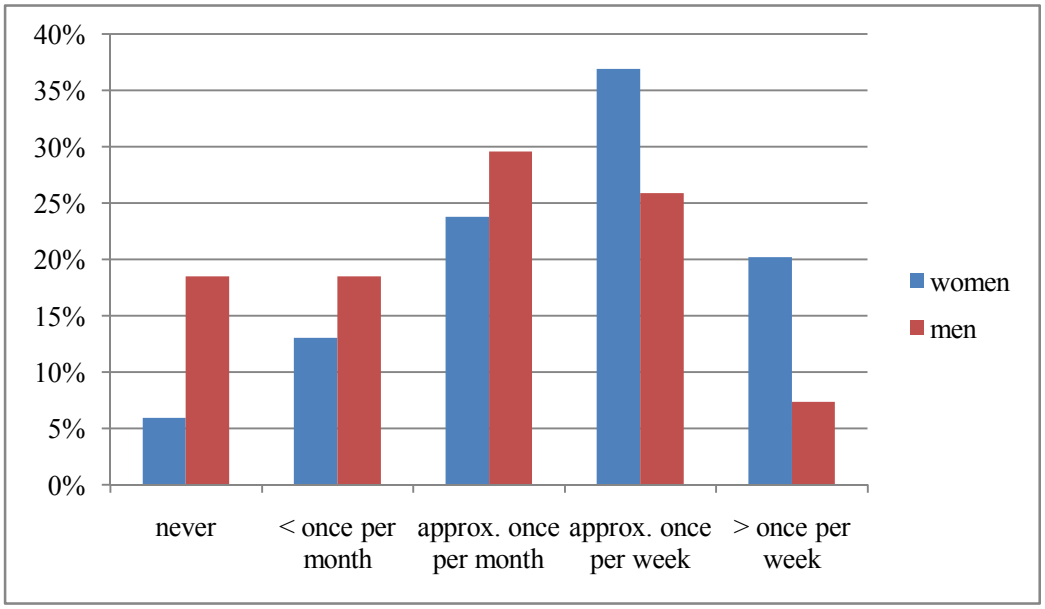

Figure 16 Distribution of purchase frequency of organic food by gender

Given that $p = 0.19$ for women and $p = 0.69$ for men, and using $\alpha = 0.05$, the purchase frequency of organic food is normally distributed for women and men independently. The results of a Shapiro-Wilk test of normality can be seen in Table 7.

Variable	Obs	W	V	z	Prob>z
purch_women	82	0.97887	1.480	0.860	0.19476
purch_men	24	0.97113	0.779	-0.510	0.69496

Table 7 Shapiro-Wilk test of normality for purchase frequency of organic food by gender

Due to the significant difference between the purchasing behavior for organic food of women and men and the insufficient sample size of male participants, only women are considered in the further analysis.

Attitudes and intentions

Table 9 summarizes the findings of previous studies analyzing individuals' motives of organic food purchase and the results of the present study. In all the presented studies, 7-point scales were used to measure to what extent respondents agree or do not agree with the motives presented. In order to measure internal consistency of each construct, Cronbach's alpha is calculated and only constructs yielding a value higher than 0.7 are accepted (Chen et al., 2007). Given that $p = 0.54$ for the construct health consciousness, $p = 0.91$ for the construct food safety concern and $p = 0.14$ for the construct environmental protection, and using $\alpha = 0.05$, these variables are normally

distributed, yet not the constructs sensory appeal, animal welfare and satisfaction. The results of a Shapiro-Wilk test of normality can be seen in Table 8.

Variable	Obs	W	V	z	Prob>z
Health	82	0.98633	0.957	-0.096	0.53811
Foodsafety	82	0.99234	0.537	-1.365	0.91383
Appeal	82	0.96462	2.479	1.992	0.02321
Environment	82	0.97676	1.628	1.070	0.14242
Animals	82	0.92117	5.522	3.749	0.00009
Satisfaction	82	0.90163	6.891	4.235	0.00001

Table 8 Shapiro-Wilk test of normality for *Health, Foodsafety, Appeal, Environment, Animals* and *Satisfaction*

A Wilcoxon signed-rank test indicates that participants rate satisfaction (M = 5.36, SD = 0.90) significantly higher than food safety concern, z = -2.59, $p < 0.01$. A t-test reveals that participants rate environmental protection (M = 5.26, SD = 0.94) significantly higher than health consciousness (M = 4.94, SD = 0.85), t (81) = -2.76, $p <$ 0.01. The results of a one sample t-test indicate that participants rate food safety concern (M = 5.12, SD = 0.86) significantly higher than health consciousness (M = 4.94, SD = 0.85), t (81) = -2.43, $p < 0.05$.

	Present study		**Chen et al. (2007)**	**Aertsens et al. (2011)**
	M	*α*	*M*	*M*
Satisfaction	5.36	0.90	5.77*	-
Animal welfare	5.30	0.88	5.32	4.6*
Environmental protection	5.26	0.71	5.86*	5.9*
Food safety concern	5.12	0.71	-	5.2
Health consciousness	4.94	0.83	5.82*	5.8*
Sensory appeal	4.80	0.71	5.53*	5.3*

Table 9 Comparison of the results of different studies using a 7-point scale
*significant at $p < 0.01$

A Wilcoxon signed-rank test indicates a significant difference between the mean score for satisfaction obtained in the present study (M = 5.36, SD = 0.90) and the mean score obtained by Chen et al. (2007) (5.77), z = -22.45, $p < 0.01$. A Wilcoxon signed-rank test indicates also a significant difference between the mean score for animal welfare obtained in the present study (M = 5.3, SD = 0.88) and the mean score obtained by Aertsens et al. (2011) (4.6), z = 4.99, $p < 0.01$. A one sample t-test indicates a significant difference between the mean score for environmental protection obtained in the present study (M = 5.26, SD = 0.94) and the score obtained by Aertsens et al. (2011)

(5.9), t (81) = -6.81, $p < 0.01$. A one sample t-test reveals also a significant difference between the mean score for environmental protection obtained in the present study (M = 5.26, SD = 0.94) and the mean score obtained by Chen et al. (2007) (5.86), t (81) = -5.80, $p < 0.01$. A one sample t-test indicates a significant difference between the mean score for health consciousness obtained in the present study (M = 4.94, SD = 0.85) and the mean score obtained by Aertsens et al. (2011) (5.8), t (81) = -9.13, $p < 0.01$. A one sample t-test also reveals a significant difference between the mean score for health consciousness obtained in the present study (M = 4.94, SD = 0.85) and the mean score obtained by Chen et al. (2011) (5.2.), t (81) = -9.34, $p < 0.01$. A Wilcoxon signed-rank test indicates a significant difference between the mean score for sensory appeal obtained in the present study (M = 4.8, SD = 0.71) and the mean score obtained by Aertsens et al. (2011) (5.3), z = -4.9, $p < 0.01$. There is also a significant difference between the mean score for sensory appeal obtained in the present study (M = 4.8, SD = 0.71) and the mean score obtained by Aertsens et al. (2011) (5.53), z = -6.23, $p < 0.01$.

Table 11 summarizes the finding of a previous study analyzing individuals' barriers of organic food purchase and the results of the present study. In all the presented studies, 7-point scales were used to measure to what extent respondents agree or do not agree with the barriers presented. In order to measure internal consistency of each construct, Cronbach's alpha is calculated. Due to insufficiently high values, constructs yielding a value higher than 0.6 are accepted. Given that p = 0.78 for lack of availability, p = 1.00 for appeal, p = 0.17 for trust, p = 0.93 for knowledge and p = 0.07 for image, and using α = 0.05, these variables are normally distributed, yet not price and indifference. The results of a Shapiro-Wilk test of normality are presented in Table 10.

Variable	Obs	W	V	z	Prob>z
Price	82	0.91805	5.740	3.834	0.00006
Availability	82	0.99001	0.699	-0.784	0.78360
Appeal	82	0.96462	2.479	1.992	0.02321
Trust	82	0.97807	1.536	0.942	0.17317
Knowledge	82	0.99273	0.509	-1.481	0.93067
Indifference	82	0.94949	3.538	2.772	0.00278
Image	82	0.97223	1.945	1.460	0.07219

Table 10 Shapiro-Wilk test of normality for *Price, Availability, Appeal, Trust, Knowledge, Indifference* and *Image*

A Wilcoxon signed-rank test indicates that indifference (M = 5.09, SD = 1.19) is rated significantly higher than lack of availability (M = 4.63, SD = 1.11), z = -3.03, $p <$ 0.05. A one sample t-test reveals that participants rate knowledge (M = 4.47, SD = 1.45)

significantly higher than trust (M = 3.95, SD = 1.28), t (81) = -3.00, p = 0.003. A Wilcoxon signed-rank test indicates that the mean score for price (M = 2.39, SD = 1.13) is significantly lower than the mean score for image (M = 3.61, SD = 1.62), z = -5.77, p < 0.01.

	Present study		**Aertsens et al. (2011)**
	M	*α*	*M*
Indifference	5.09	1.19	3.0*
Appeal	4.73	1.43	2.6*
Lack of availability	4.63	1.11	3.7*
Knowledge	4.47	1.45	2.6*
Trust	3.95	1.28	2.6*
Image	3.61	1.62	2.0*
Price	2.39	1.13	4.4*

Table 11 Comparison between the results of the present study and another study using a 7-point scale
*significant at p < 0.01

A Wilcoxon signed-rank test indicates a significant difference between the present score for indifference (M = 5.09, SD = 1.19) and the mean score obtained by Aertsens et al. (2011) (3.0), z = 7.60, p < 0.05. A one sample t-test indicates a significant difference between the mean score for appeal obtained in the present study (M = 4.80, SD = 0.82) and the mean score obtained by Aertsens et al. (2011) (2.6), t (81) = 24.31, p < 0.01. A one sample t-test indicates a significant difference between the mean score for lack of availability obtained in the present study (M = 4.63, SD = 1.11) and the mean score obtained by Aertsens et al. (2011) (3.7), t (81) = 7.53, p < 0.01. A one sample t-test indicates a significant difference between the mean score for knowledge obtained in the present study (M = 4.47, SD = 1.45) and the mean score obtained by Aertsens et al. (2011) (2.6), t (81) = 11.66, p < 0.01. A one sample t-test indicates a significant difference between the mean score for trust obtained in the present study (M = 3.95, SD = 1.28) and the mean score obtained by Aertsens et al. (2011) (2.6), t (81) = 9.54, p < 0.01. A one sample t-test indicates a significant difference between the mean score for image obtained in the present study (M = 3.61, SD = 1.62) and the mean score obtained by Aertsens et al. (2011) (2.0), t (81) = 8.98, p < 0.01. A Wilcoxon signed-rank test indicates a significant difference between the mean score for price obtained in the present study (M = 2.39, SD = 1.13) and the mean score obtained by Aertsens et al. (2011) (4.4), z = -7.59, p < 0.01.

All means and standard deviations of the 92 items are depicted in Appendix B.

Confirmatory factor analysis

Four independent confirmatory factor analyses are conducted in order to generate dimensions deduced from the 92 items regarding motives and barriers.

The first dimension named "positive attitude toward organic food" embraces 29 items. The first factor explains 45.42 % of the variance of the items considered in the factor analysis. Due to high loadings, all items, except for the variables *life_att1, life_att2* and *life_att3*, are used to construct this dimension. Good internal consistency of these items is evident with a Cronbach's alpha of 0.9188.

The second factor analysis yields a dimension named "positive intention toward organic food" which combines 30 items and explains 49.60 % of the variance of the items considered in this factor analysis. Due to high loadings, all items, except for the variables *life_int1* and *life_int3*, to construct this dimension. A Cronbach's alpha of 0.9412 yields good internal consistency of these items.

The third factor analysis reveals a dimension named "negative attitude toward organic food" which embraces 14 items. This factor explains 57.03 % of the variance of the items considered in this factor analysis. Due to high loadings, all items, except for *appeal_att2*, are used to construct this dimension. The adequate internal consistency of the items is evident with a Cronbach's alpha of 0.7958.

A fourth factor named "negative intention toward organic food" combines 15 items and explains 66.95 % of the variance of the items considered in this factor analysis. Due to high loadings, all items are used to construct this dimension. Good internal consistency of these items is evident with a Cronbach's alpha of 0.9031.

An overview of the factor loadings of the items for the four factors is depicted in Appendix C.

Table 12 displays the overall ratings of the four dimensions. The highest overall mean-rated dimension is "positive intention toward organic food" and the lowest overall mean-rated dimension is "negative attitude toward organic food".

Variable	*M*	*SD*
Positive attitude	5.03	0.68
Positive intention	5.07	0.82
Negative attitude	4.37	0.78
Negative intention	6.05	0.98

Table 12 Overall importance ratings of the five factors or dimensions

Using $\alpha = 0.05$ and given that $p = 0.5231$ for *positive attitude*, $p = 0.2146$ for *positive intention*, $p = 0.8402$ for *negative attitude* and $p = 0.2936$ for *negative intention*, all factors are normally distributed. The results of a Shapiro-Wilk test of normality are presented in Table 13.

Variable	Obs	W	V	z	Prob>z
Pos_att	82	0.98610	0.974	-0.058	0.52314
Pos_int	82	0.97953	1.434	0.790	0.21462
Neg_att	82	0.99093	0.635	-0.995	0.84015
Neg_int	82	0.98172	1.281	0.543	0.29360

Table 13 Shapiro-Wilk test of Normality for *positive attitude, positive intention, negative attitude and negative intention*

A correlation analysis reveals a strong positive relationship between *positive attitude* and *positive intention*, $r = 0.7217$, $p < 0.01$, as well as between *negative attitude* and *negative intention*, $r = 0.7344$, $p < 0.01$.

The relationship between *purchase frequency* and *positive attitude* is positive, $r = 0.2808$, $p < 0.05$, and the relationship between *purchase frequency* and *positive intention*, $r = 0.3852$, $p < 0.01$. The relationship between *purchase frequency* and *negative attitude* is positive, $r = 0.5210$, $p < 0.01$, and the relationship between *purchase frequency* and *negative intention* is positive, $r = 0.4528$, $p < 0.01$.

Besides, there is a positive relationship between *positive attitude* and *negative attitude*, $r = 0.2941$, $p < 0.01$, and between *positive attitude* and *negative intention*, $r = 0.3305$, $p < 0.01$. *Positive intention* and *negative attitude* are also positively correlated, $r = 0.2974$, $p < 0.01$. Table 14 depicts the intercorrelations between the four dimensions and *purchase frequency*. The relationships between the different dimensions are visualized in Appendix D.

	purchase frequency	*positive attitude*	*positive intention*	*negative attitude*	*negative intention*
purchase frequency	1.0000				
positive attitude	0.2808	1.0000			
positive intention	0.3852	0.7217	1.0000		
negative attitude	0.5210	0.2941	0.2874	1.0000	
negative intention	0.4528	0.3305	0.1674	0.7344	1.0000

Table 14 Intercorrelations among the variables

7 Discussion and conclusion

The current research sought to explore the motives and barriers which drive individuals in Germany to buy organic food products and how attitudes, intentions to buy and actual purchase behavior are related. In this study, women were found to purchase significantly more organic food than men so that the analysis has been limited to this specific group of participants. Earlier studies found that women are the primary shoppers in a family (Aguirre, 2007) which could be an explanation for why women are found to purchase significantly more organic food than men. However, mean age was low in the overall sample and a large majority of participants does not have children so that this may not be the underlying reason. Another explanation could be that women may be more concerned by environmental topics than men (Kollmuss & Agyeman, 2002) and therefore show a greater interest for this kind of product. It is not clear whether men only buy less organic food products than women or whether men shop less than women in general. It would be interesting to investigate this difference between men and women in a future study. Besides gender, there has no relationship been found between purchase behavior for organic food and other demographic variables.

Women seem to value the satisfactory outcome of organic food highest, followed by animal welfare and environmental protection. The results show that health consciousness and sensory appeal are rated the lowest. Altogether, compared with earlier studies using the same scale, the participants gave in general lower scores. This research identified indifference as the greatest barrier. Participants are indifferent toward organic food and do not see a difference between organically and conventionally produced food. Appeal and lack of availability were also rated among the highest barriers. Compared with an earlier study using the same scale, the participants in this study gave higher scores and had therefore stronger negative attitudes. Price was found to not to be a barrier. The findings regarding motives are in line with earlier studies using German samples. Padilla Bravo et al. (2013) reveals that altruism defined through the concern for environment and animal welfare is the most important motive of organic food purchase. Similarly to Padilla Bravo et al. (2013), Zander & Hamm (2010) report that German purchasers of organic food care about ethical aspects such as animal welfare. A new finding is that participants value satisfaction generated from organic food the most. Padel & Foster (2005) revealed that the support of local farming makes participants “feel good”. It would be interesting to investigate whether satisfaction

analyzed in the present study is linked to a positive attitude toward regionalism. The low rating of price is not completely in line with previous studies. Among the investigated previous studies, only Tarkiainen & Sundqvist (2005) find that price does not affect purchase behavior. The researchers explain that there is an almost non-existing gap between prices for organic and prices for conventional food products. It can be hypothesized that prices between organic and conventional food products are not perceived to be different by German participants due to the introduction of organic food in discounters. Another explanation could be that prices play a less important role for people living in richer countries. The results show that participants care about the sensory appeal of organic food but also that there is still a lack of availability of organic food products.

The study also revealed that the relationships between attitudes and intentions toward organic food are positive and strong. Positive and negative attitudes toward organic food as well as positive and negative purchase intentions of organic food are positively correlated with purchase behavior for organic food, although they are less strong. The findings are surprising as they reveal that participants who have strong positive attitudes have, at the same time, also strong negative attitudes. Due to the fact that indifference toward organic food was rated the highest, this may just reflect that participants who buy more organic food, are more involved in this type of food and can therefore have strong positive and negative attitudes toward it at the same time.

The present research has implications for economics insofar that marketers should not only be aware of people's altruistic motivations but also of the fact that organic food purchase gives satisfaction to them. This is an overall motive which may combine all advantages of purchasing organic food. Also it should be noted that attitudes and intentions are closely related and may be positive but that this does not necessarily lead to purchases. Marketers should investigate more in depth why men purchase less organic food in order to adjust marketing activities. This would not only lead to higher sales but purchase of organic food also yields benefits regarding sustainability.

8 Limitations and future research

The present study and methodology are new to several extents. Firstly, the survey embraced many variables. Therefore, attitude and intention were not measured

by one variable, but were based on multiple items. This ascertains validity of the results. In addition to that, motives and barriers were not measured separately from attitudes and intentions but they were combined.

It has to be noted that the sample used in the present study is specific. Primarily, only the answers of participants who know what organic food is and who can define it were considered. Previous studies do not often filter for a certain type of participant, yet they have larger sample sizes and therefore ascertain higher reliability of the results. In addition, only the answers of women were taken into account. It would be interesting to make a comparison between women's and men's motives and barriers, attitudes and intentions toward organic food.

It should be considered that a study dealing with organic food may be subject to biased answers due to socially desirable answering. Due to self-report methods, attitudes and intentions that are phrased positively may have been rated higher and negatively phrased attitudes and intentions may have been rated lower.

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Appendix A

Questionnaire

Have you ever heard of the term "organic food"?

Yes ( ) No ( )

Please state whether you think following statements are true or false.

Organic farmers do not use synthetic pesticides.

Yes ( ) No ( )

Organic farmers may use synthetic fertilizers.

Yes ( ) No ( )

Organic farmers may use genetically modified seeds.

Yes ( ) No ( )

Please state to what extent you agree or disagree with the following statements.

Organic food is healthy.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

Organic food contains a lot of vitamins and minerals.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

Organic food is good for my skin/teeth/hair/nails.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

Organic food is high in fiber and proteins.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

Organic food is nutritious.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

Organic food has lower chemical residues than conventional food.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

Organic food has more vitamins and minerals than conventional food.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

Organic food is safer to eat than conventional food.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

Organic food is healthier to eat than conventionally grown food.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I am worried about food safety.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

Organic food smells good.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

Organic food looks nice.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

Organic food has a pleasant texture.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

Organic food tastes good.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

Organic food is prepared in an environmentally friendly way.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

The consumption of organic food helps to preserve the environment.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

The consumption of organic food helps to reduce soil pollution and the chemicals which run off into lakes and rivers.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

Organic food is packaged in an environmentally friendly way.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

The living conditions of animals kept on organic farms are better than the living conditions of animals kept on conventional farms.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

Animals kept on organic farms are better treated than animals kept on conventional farms.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

Organic food does not contain any flavor enhancers, artificial aromas and colorants.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

Organic food contains natural ingredients.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

Organic food is of superior quality.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

Organic food is fresh because it has a shorter shelf-life.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I am curious of organic food.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

Organic food makes me feel good.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

Organic food gives the sense of doing the right thing.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

Organic food provides contentment.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

Organic food is in fashion.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

Organic food is associated with an "alternative" lifestyle.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

Organic food is a status symbol.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

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Please state to what extent you would buy organic food due to the named reasons.

I would buy organic food because it is healthy.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I would buy organic food because it has lot of vitamins and minerals.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I would buy organic food because it is good for my skin/teeth/hair/nails.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I would buy organic food because it is high in fiber and proteins.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I would buy organic food because it is nutritious.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I would buy organic food because it has lower chemical residues than conventional food.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I would buy organic food because it has more vitamins and minerals than conventional food.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I would buy organic food because it is safer to eat than conventional food.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I would buy organic food because it is healthier to eat than conventionally grown food.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I would buy organic food because I am worried about food safety.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I would buy organic food because it smells good.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I would buy organic food because it looks nice.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I would buy organic food because it has a pleasant texture.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I would buy organic food because it tastes good.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I would buy organic food because it is prepared in an environmentally friendly way.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I would buy organic food because it helps to preserve the environment.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I would buy organic food because it helps to reduce soil pollution and the chemicals which run off into lakes and rivers.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I would buy organic food because it is packaged in an environmentally friendly way.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I would buy organic food because the living conditions of animals kept on organic farms are better than the living conditions of animals kept on conventional farms.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I would buy organic food because animals kept on organic farms are better treated than animals kept on conventional farms.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I would buy organic food because it does not contain any flavor enhancers, artificial aromas and colorants.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I would buy organic food because it contains natural ingredients.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I would buy organic food because it has superior quality.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I would buy organic food because it has a shorter shelf-life.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I would buy organic food out of curiosity.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I would buy organic food because it makes me feel good.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I would buy organic food because it gives the sense of doing the right thing.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I would buy organic food because it provides contentment.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I would buy organic food because it is in fashion.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I would buy organic food because it is associated with an "alternative" lifestyle.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I would buy organic food because it is a status symbol.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

---

Please state to what extent you agree or disagree with the following statements.

Organic food is expensive.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I am not willing to pay more for organic food.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

Organic food products are hard to find.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

There are not a lot of selling locations for organic food.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

There is only a small a variety of organic food.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

Organic food such as organic fruits and vegetables does not have attractive physical appearance.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

Organic food such as organic fruits and vegetables often has physical defects.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I do not trust that organic food products are really organic.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

Food certifications are not reliable.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I do not know what organic products are.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I am not adequately informed about organic food.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

Organic food does not have anything special to offer.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I am satisfied with conventional food products.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I am not interested in organic food.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

Organic food has a "tree hugger" image.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

---

Please state to what extent you would buy organic food due to the named reasons.

I would not buy organic food because it is expensive.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I would not buy organic food because I am not willing to pay more for it.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I would not buy organic food products because they are hard to find.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I would not buy organic food products because there are not a lot of selling locations for organic food.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I would not buy organic food because there is only a small variety of organic food.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I would not buy organic food such as organic fruits and vegetables because it does not have attractive physical appearance.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I would not buy organic food such as organic fruits and vegetables because it often has physical defects.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I would not buy organic food because I do not trust that it is really organic.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I would not buy organic food because food certifications are not reliable.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I would not buy organic food because I do not know what organic products are.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I would not buy organic food because I am not adequately informed about organic food.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I would not buy organic food because it does not have anything special to offer.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I would not buy organic food because I am satisfied with conventional food products.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I would not buy organic food because I am not interested in it.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

I do not buy organic food because it has a "tree hugger" image.

I strongly disagree 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) I strongly agree

---

How often do you buy organic food?

never ( ) less than once per month. ( ) approx. once per month ( )

approx. once per week ( ) more than once per week ( )

What is your gender?

female ( ) male ( )

What is your age?

____

What is your highest educational level?

No school degree ( ) secondary school level I ( ) secondary school level II ( )

baccalaureate ( ) bachelor's degree ( ) master's degree ( ) PhD ( )

What is your monthly income?

>1000€ ( ) 1000-2000€ ( ) 2001-3000€ ( )

3001-4000€ ( ) 4001-5000€ ( ) >5000€ ( )

How many children do live in your household?

____

Appendix B

Means and standard deviations of the items for positive attitude toward organic food

Variable	Obs	Mean	Std. Dev.	Min	Max
health_att1	82	5.402439	1.004432	3	7
health_att2	82	5	1.122167	1	7
health_att3	82	4.695122	1.073692	2	7
health_att4	82	4.5	1.178511	1	7
health_att5	82	5.109756	1.111179	2	7
safety_att1	82	5.658537	.9840645	2	7
safety_att2	82	4.646341	1.355118	1	7
safety_att3	82	4.963415	.9743009	3	7
safety_att4	82	5.121951	1.336942	1	7
safety_att5	82	5.231707	1.557925	1	7
sensory_att1	82	4.743902	1.063548	1	7
sensory_att2	82	4.487805	1.269236	1	7
sensory_att3	82	4.536585	1.135239	2	7
sensory_att4	82	5.426829	1.01872	3	7
environ_att1	82	5.085366	1.15685	2	7
environ_att2	82	5.256098	1.173903	2	7
environ_att3	82	5.439024	.9698869	3	7
environ_att4	82	3.804878	1.337392	1	6
animal_att1	82	5.317073	1.215924	1	7
animal_att2	82	5.292683	1.309866	1	7
natural_att1	82	4.682927	1.669465	1	7
natural_att2	82	5.426829	.9030878	3	7
quality_att1	82	5.170732	.9136128	2	7
quality_att2	82	4.47561	1.344634	1	7
curios_att	82	5.207317	1.429304	1	7
satis_att1	82	5.353659	1.280162	1	7
satis_att2	82	5.5	1.167989	2	7
satis_att3	82	5.231707	1.363536	1	7
life_att1	82	5.97561	1.143696	1	7
life_att2	82	5.036585	1.460975	1	7
life_att3	82	5.012195	1.401004	2	7

Means and standard deviations of the items for positive purchase intention of organic food

Variable	Obs	Mean	Std. Dev.	Min	Max
health_int1	82	5.536585	1.090873	2	7
health_int2	82	5.146341	1.306413	2	7
health_int3	82	4.597561	1.506035	1	7
health_int4	82	4.756098	1.291577	2	7
health_int5	82	4.926829	1.194437	2	7
safety_int1	82	5.97561	.9683333	3	7
safety_int2	82	4.939024	1.381961	2	7
safety_int3	82	5.085366	1.316573	1	7
safety_int4	82	5.54878	1.218706	2	7
safety_int5	82	5.158537	1.543361	1	7
sensory_int1	82	4.073171	1.513564	1	7
sensory_int2	82	4.146341	1.449751	1	7
sensory_int3	82	4	1.457209	1	7
sensory_int4	82	5.609756	.9655306	3	7
environ_int1	82	5.54878	1.090389	2	7
environ_int2	82	5.682927	1.265673	2	7
environ_int3	82	5.646341	1.270481	2	7
environ_int4	82	4.597561	1.412989	1	7
animal_int1	82	5.634146	1.328809	2	7
animal_int2	82	5.743902	1.303471	1	7
natural_int1	82	5.768293	1.220188	2	7
natural_int2	82	5.670732	1.006827	3	7
quality_int1	82	5.463415	1.146063	2	7
quality_int2	82	4.292683	1.409735	1	7
curios_int	82	4.609756	1.653698	1	7
satis_int1	82	5.195122	1.355729	1	7
satis_int2	82	5.390244	1.312392	1	7
satis_int3	82	5.097561	1.487477	1	7
life_int1	82	2.646341	1.502031	1	6
life_int2	82	3.195122	1.666215	1	7
life_int3	82	2.743902	1.554055	1	6

Means and standard deviations of the items for negative attitude toward organic food

Variable	Obs	Mean	Std. Dev.	Min	Max
price_att1	82	2.390244	1.130455	1	6
price_att2	82	4.439024	1.685798	1	7
avail_att1	82	5.170732	1.349942	2	7
avail_att2	82	4.585366	1.448296	1	7
avail_att3	82	4.121951	1.485654	2	7
appeal_att1	82	4.731707	1.431987	2	7
appeal_att2	82	3.45122	1.187927	1	6
trust_att1	82	4.219512	1.414426	1	7
trust_att2	82	3.670732	1.515801	1	7
know_att1	82	5.158537	1.681192	1	7
know_att2	82	3.780488	1.707098	1	7
indiff_att1	82	5.121951	1.327675	1	7
indiff_att2	82	4.353659	1.54258	1	7
indiff_att3	82	5.792683	1.437915	1	7
image_att	82	3.609756	1.623562	1	7

Means and standard deviations of the items for negative purchase intention of organic food

Variable	Obs	Mean	Std. Dev.	Min	Max
price_int1	82	4.158537	1.666441	1	7
price_int2	82	4.646341	1.673113	1	7
avail_int1	82	5.390244	1.331073	2	7
avail_int2	82	5.426829	1.247521	1	7
avail_int3	82	5.219512	1.499172	1	7
appeal_int1	82	5.52439	1.389783	2	7
appeal_int2	82	5.597561	1.322733	2	7
trust_int1	82	4.414634	1.706568	1	7
trust_int2	82	4.268293	1.610527	1	7
know_int1	82	5.231707	1.468171	1	7
know_int2	82	4.817073	1.572354	1	7
indiff_int1	82	5.146341	1.415278	1	7
indiff_int2	82	4.609756	1.683296	1	7
indiff_int3	82	5.621951	1.454157	1	7
image_int	82	5.743902	1.368165	2	7

Appendix C

Eigenvalues and explained variance of the factors for positive attitude toward organic food

Factor analysis/correlation — Number of obs = 82
Method: principal factors — Retained factors = 21
Rotation: (unrotated) — Number of params = 441

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	9.27963	6.66028	0.4542	0.4542
Factor2	2.61935	0.56041	0.1282	0.5824
Factor3	2.05894	0.77260	0.1008	0.6832
Factor4	1.28634	0.07656	0.0630	0.7462
Factor5	1.20978	0.24025	0.0592	0.8054
Factor6	0.96953	0.16873	0.0475	0.8529
Factor7	0.80080	0.11130	0.0392	0.8921
Factor8	0.68949	0.16199	0.0337	0.9258
Factor9	0.52751	0.02407	0.0258	0.9516
Factor10	0.50343	0.07556	0.0246	0.9763
Factor11	0.42788	0.07993	0.0209	0.9972
Factor12	0.34795	0.05821	0.0170	1.0142
Factor13	0.28974	0.05560	0.0142	1.0284
Factor14	0.23414	0.06215	0.0115	1.0399
Factor15	0.17199	0.03308	0.0084	1.0483
Factor16	0.13891	0.02974	0.0068	1.0551
Factor17	0.10917	0.01715	0.0053	1.0604
Factor18	0.09201	0.02381	0.0045	1.0649
Factor19	0.06821	0.03531	0.0033	1.0683
Factor20	0.03289	0.03096	0.0016	1.0699
Factor21	0.00194	0.03097	0.0001	1.0700
Factor22	-0.02903	0.01864	-0.0014	1.0686
Factor23	-0.04767	0.05254	-0.0023	1.0662
Factor24	-0.10021	0.01439	-0.0049	1.0613
Factor25	-0.11460	0.02322	-0.0056	1.0557
Factor26	-0.13782	0.01321	-0.0067	1.0490
Factor27	-0.15103	0.02537	-0.0074	1.0416
Factor28	-0.17640	0.01239	-0.0086	1.0329
Factor29	-0.18879	0.03393	-0.0092	1.0237
Factor30	-0.22272	0.03893	-0.0109	1.0128
Factor31	-0.26165	.	-0.0128	1.0000

LR test: independent vs. saturated: chi2(465) = 1468.81 Prob>chi2 = 0.0000

Factor loadings of the items for positive attitude toward organic food

Factor loadings (pattern matrix) and unique variances

Variable	Factor1	Factor2	Factor3	Factor4	Factor5
health_att1	0.6693	-0.2942	-0.2514	-0.0476	-0.0065
health_att2	0.7186	-0.4435	-0.1556	-0.1228	-0.1039
health_att3	0.6715	-0.3105	0.1795	0.1278	-0.0426
health_att4	0.4662	-0.4076	-0.2868	-0.0631	0.1212
health_att5	0.6760	0.0113	-0.0121	-0.2361	-0.2528
safety_att1	0.4939	0.2092	-0.2438	0.0053	0.3680
safety_att2	0.6522	-0.3520	-0.1607	-0.0805	0.0355
safety_att3	0.5675	0.0418	-0.3178	0.2666	-0.0202
safety_att4	0.6738	-0.2248	0.0549	0.0677	-0.0707
safety_att5	0.3112	-0.2412	0.3028	0.3718	-0.1000
sensory_att1	0.6706	-0.3145	0.1182	-0.1452	-0.1361
sensory_att2	0.4278	-0.1947	0.3346	0.2115	0.0947
sensory_att3	0.6191	-0.1678	0.0285	-0.0181	0.0323
sensory_att4	0.5260	0.2207	0.0003	-0.1505	-0.2781
environ_att1	0.5444	0.3726	-0.0333	-0.2913	0.2301
environ_att2	0.5702	0.4856	0.0711	-0.1380	0.2244
environ_att3	0.4216	0.4164	-0.1024	-0.1592	0.4323
environ_att4	0.4711	-0.1875	-0.0743	0.0177	0.1090
animal_att1	0.3130	0.5244	-0.3990	0.4425	-0.2751
animal_att2	0.3644	0.4445	-0.4314	0.4439	-0.1465
natural_att1	0.5708	-0.0240	-0.2656	0.0791	0.0637
natural_att2	0.6834	0.0381	-0.1861	-0.2044	0.1278
quality_att1	0.7217	-0.1980	0.0069	0.2130	-0.0938
quality_att2	0.3859	0.0181	-0.1106	-0.0434	0.0368
curios_att	0.5393	0.0394	0.4878	-0.0890	-0.0500
satis_att1	0.5886	0.3825	0.4282	0.0486	-0.0170
satis_att2	0.7191	0.3792	0.2746	-0.0582	-0.0889
satis_att3	0.6615	0.3771	0.3985	0.0038	-0.1623
life_att1	0.1186	0.0026	0.4364	0.3098	0.1820
life_att2	0.1809	-0.1512	-0.1411	0.2506	0.3950
life_att3	-0.0399	-0.1659	0.3138	0.3057	0.4524

Eigenvalues and explained variances of the factors for positive purchase intention of organic food

Factor analysis/correlation — Number of obs = 82
Method: principal factors — Retained factors = 18
Rotation: (unrotated) — Number of params = 405

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	11.28235	8.22057	0.4960	0.4960
Factor2	3.06178	0.56376	0.1346	0.6306
Factor3	2.49803	0.75177	0.1098	0.7404
Factor4	1.74625	0.48469	0.0768	0.8172
Factor5	1.26157	0.40679	0.0555	0.8727
Factor6	0.85478	0.20332	0.0376	0.9102
Factor7	0.65146	0.10313	0.0286	0.9389
Factor8	0.54833	0.14929	0.0241	0.9630
Factor9	0.39904	0.03346	0.0175	0.9805
Factor10	0.36558	0.07290	0.0161	0.9966
Factor11	0.29268	0.01241	0.0129	1.0095
Factor12	0.28027	0.02867	0.0123	1.0218
Factor13	0.25160	0.08866	0.0111	1.0329
Factor14	0.16294	0.01644	0.0072	1.0400
Factor15	0.14650	0.04995	0.0064	1.0465
Factor16	0.09655	0.00620	0.0042	1.0507
Factor17	0.09035	0.04056	0.0040	1.0547
Factor18	0.04979	0.05365	0.0022	1.0569
Factor19	-0.00386	0.01753	-0.0002	1.0567
Factor20	-0.02139	0.03221	-0.0009	1.0558
Factor21	-0.05360	0.00465	-0.0024	1.0534
Factor22	-0.05825	0.01772	-0.0026	1.0508
Factor23	-0.07597	0.01246	-0.0033	1.0475
Factor24	-0.08844	0.01945	-0.0039	1.0436
Factor25	-0.10789	0.01144	-0.0047	1.0389
Factor26	-0.11933	0.00772	-0.0052	1.0336
Factor27	-0.12705	0.01308	-0.0056	1.0280
Factor28	-0.14013	0.01067	-0.0062	1.0219
Factor29	-0.15080	0.01561	-0.0066	1.0152
Factor30	-0.16641	0.01389	-0.0073	1.0079
Factor31	-0.18029	.	-0.0079	1.0000

LR test: independent vs. saturated: chi2(465) = 1934.51 Prob>chi2 = 0.0000

Factor loadings of the items for positive purchase intention of organic food

Factor loadings (pattern matrix) and unique variances

Variable	Factor1	Factor2	Factor3	Factor4	Factor5
health_int1	0.6794	0.2185	-0.3318	-0.0466	0.0845
health_int2	0.7664	0.3752	-0.2661	-0.0590	0.1423
health_int3	0.6570	0.3731	0.0509	0.0249	-0.1351
health_int4	0.6284	0.3989	-0.1683	-0.0981	0.2218
health_int5	0.7057	0.1098	-0.0728	-0.1021	-0.1049
safety_int1	0.5641	-0.3528	-0.2023	0.1406	0.1306
safety_int2	0.7061	0.3726	-0.3303	-0.0241	0.1138
safety_int3	0.6650	0.3869	-0.1302	0.0848	0.1102
safety_int4	0.7258	-0.0317	-0.3762	0.0298	0.1335
safety_int5	0.6470	0.1081	-0.1144	0.0296	-0.1520
sensory_int1	0.4511	0.2943	0.5065	-0.2781	-0.2420
sensory_int2	0.4680	0.3171	0.4223	-0.0769	-0.2144
sensory_int3	0.5667	0.3322	0.4444	-0.2548	-0.0714
sensory_int4	0.5727	0.2113	-0.2210	0.0741	-0.3102
environ_int1	0.6966	-0.3638	0.1382	-0.1482	0.0907
environ_int2	0.6842	-0.5094	0.1433	-0.0576	0.1291
environ_int3	0.6414	-0.4856	0.1977	-0.1558	0.1886
environ_int4	0.5764	-0.1382	0.2681	-0.2292	0.2006
animal_int1	0.5443	-0.5957	0.0732	-0.3029	-0.0977
animal_int2	0.5072	-0.5411	0.1282	-0.4028	-0.0068
natural_int1	0.7253	-0.2681	-0.2019	-0.0009	0.2253
natural_int2	0.6796	-0.0823	-0.0845	0.1192	0.1803
quality_int1	0.7670	0.1656	-0.1062	0.0202	0.0398
quality_int2	0.4945	0.2204	0.0456	0.1242	0.1424
curios_int	0.6121	0.2425	0.4759	-0.1328	-0.2439
satis_int1	0.6053	-0.3321	-0.0622	0.4722	-0.3428
satis_int2	0.5672	-0.2655	-0.0749	0.4412	-0.3362
satis_int3	0.5769	-0.2950	-0.0368	0.4160	-0.3043
life_int1	0.0231	0.0915	0.5448	0.3933	0.3751
life_int2	0.3993	0.0026	0.5748	0.3530	0.0685
life_int3	0.0777	0.1053	0.4241	0.5130	0.3512

Eigenvalues and explained variances of the factors for negative attitude toward organic food

```
Factor analysis/correlation                       Number of obs    =        82
    Method: principal factors                     Retained factors =         8
    Rotation: (unrotated)                         Number of params =        92
```

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	3.48682	2.18456	0.5703	0.5703
Factor2	1.30226	0.37348	0.2130	0.7833
Factor3	0.92879	0.13593	0.1519	0.9352
Factor4	0.79285	0.39677	0.1297	1.0649
Factor5	0.39608	0.10114	0.0648	1.1297
Factor6	0.29494	0.16011	0.0482	1.1779
Factor7	0.13483	0.12638	0.0221	1.1999
Factor8	0.00845	0.01695	0.0014	1.2013
Factor9	-0.00850	0.08718	-0.0014	1.1999
Factor10	-0.09568	0.04506	-0.0156	1.1843
Factor11	-0.14074	0.04488	-0.0230	1.1613
Factor12	-0.18563	0.01444	-0.0304	1.1309
Factor13	-0.20007	0.09261	-0.0327	1.0982
Factor14	-0.29268	0.01494	-0.0479	1.0503
Factor15	-0.30762	.	-0.0503	1.0000

```
LR test: independent vs. saturated: chi2(105) =  350.52 Prob>chi2 = 0.0000
```

Factor loadings of the items for negative attitude toward organic food

```
Factor loadings (pattern matrix) and u
```

Variable	Factor1	Factor2
price_att1	0.5446	0.1887
price_att2	0.5154	-0.1594
avail_att1	0.5288	-0.1712
avail_att2	0.3698	-0.1100
avail_att3	0.4198	-0.1937
appeal_att1	0.4032	0.3670
appeal_att2	0.2193	0.4607
trust_att1	0.5090	-0.4326
trust_att2	0.3750	-0.3850
know_att1	0.3056	-0.3729
know_att2	0.5117	-0.0291
indiff_att1	0.6798	-0.1227
indiff_att2	0.5734	0.3054
indiff_att3	0.6065	0.2675
image_att	0.4557	0.4001

Eigenvalues and explained variances of the factors for negative purchase intention of organic food

Factor analysis/correlation — Number of obs = 82
Method: principal factors — Retained factors = 8
Rotation: (unrotated) — Number of params = 92

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	6.21139	4.71748	0.6695	0.6695
Factor2	1.49391	0.67756	0.1610	0.8305
Factor3	0.81635	0.14602	0.0880	0.9185
Factor4	0.67032	0.25140	0.0722	0.9907
Factor5	0.41892	0.11165	0.0452	1.0359
Factor6	0.30727	0.18732	0.0331	1.0690
Factor7	0.11995	0.05958	0.0129	1.0819
Factor8	0.06037	0.07237	0.0065	1.0884
Factor9	-0.01199	0.06142	-0.0013	1.0871
Factor10	-0.07341	0.00618	-0.0079	1.0792
Factor11	-0.07959	0.02252	-0.0086	1.0706
Factor12	-0.10211	0.04028	-0.0110	1.0596
Factor13	-0.14239	0.05586	-0.0153	1.0443
Factor14	-0.19826	0.01440	-0.0214	1.0229
Factor15	-0.21265	.	-0.0229	1.0000

LR test: independent vs. saturated: chi2(105) = 717.09 Prob>chi2 = 0.0000

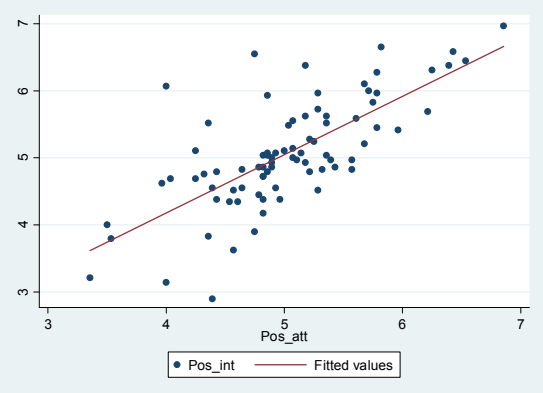
Factor loadings of the items for negative purchase intention of organic food

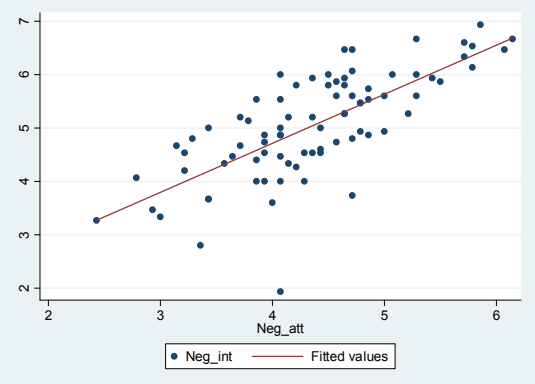
Factor loadings (pattern matrix) and u

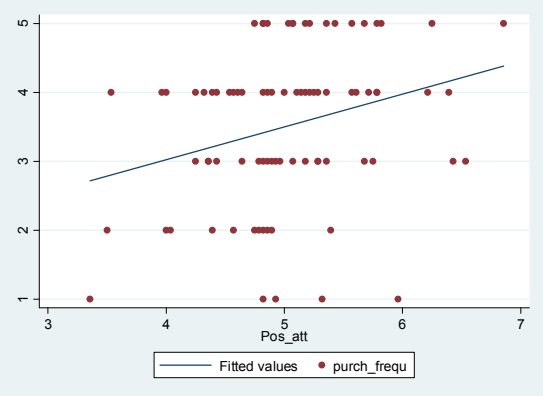
Variable	Factor1	Factor2
price_int1	0.6372	-0.1592
price_int2	0.7936	-0.1654
avail_int1	0.7372	0.1665
avail_int2	0.6597	0.1417
avail_int3	0.6054	0.1290
appeal_int1	0.6948	-0.3911
appeal_int2	0.5680	-0.4938
trust_int1	0.5239	0.5032
trust_int2	0.4585	0.5321
know_int1	0.5966	0.3851
know_int2	0.6245	0.3544
indiff_int1	0.7707	-0.0952
indiff_int2	0.7465	-0.3425
indiff_int3	0.7041	-0.0965
image_int	0.3840	-0.1847

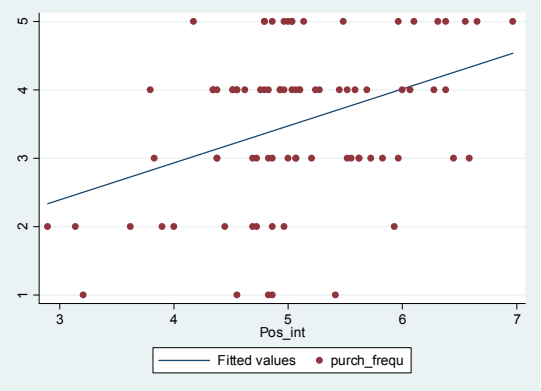
Appendix D

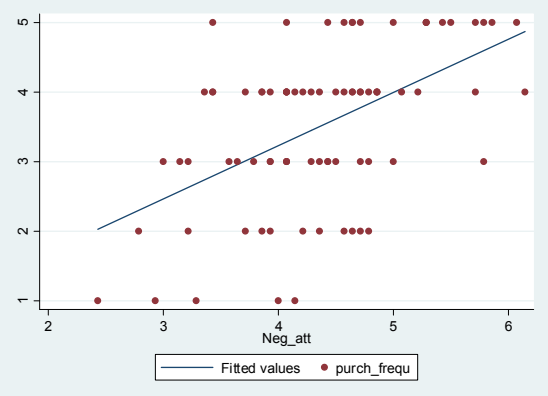
Relationships between attitude, purchase intention and purchase behavior

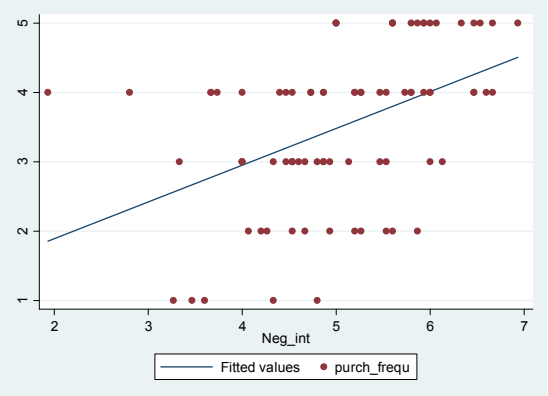


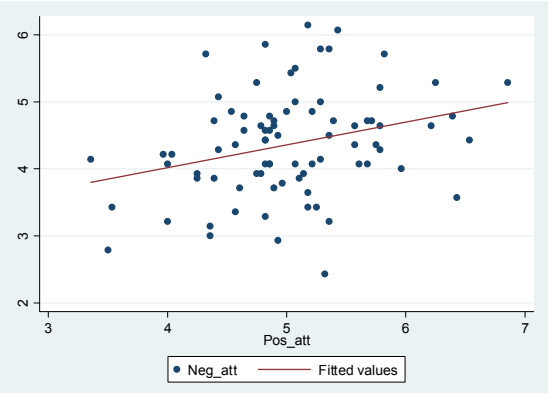


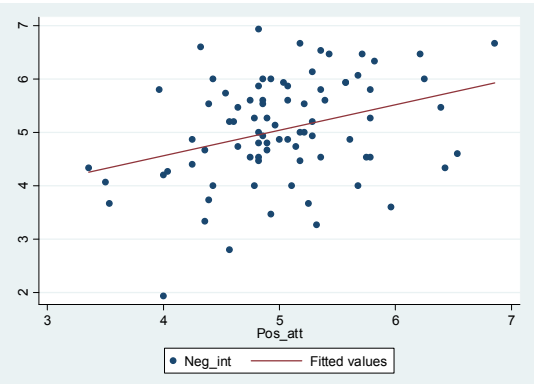


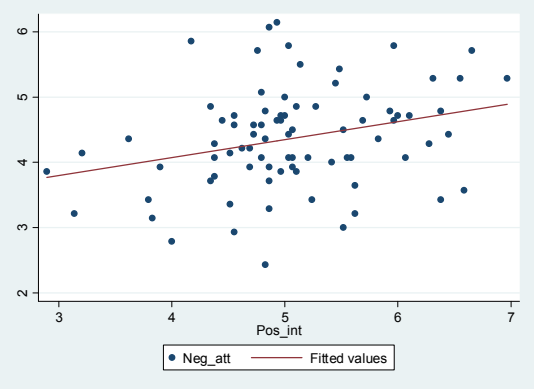











6
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4
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2
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4
5
6
7
Pos_int
Neg_att
Fitted values